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الجامعة الأردنيـــــة
كلية الدراسات العليا

التاريـــخ: ١٨ / ٤ / ٢٠١١

نموذج رقم (١٨)
اقرار والتزام بالمعايير الأخلاقية والأمانة العلمية
وقوانين الجامعة الأردنية وأنظمتها وتعليماتها
لطلبة الماجستير

أنا الطالب: رزى محمد حسين داودمي الرقم الجامعي: (٨٠٧٠٢٢٤)

تخصص: علوم البيئة وادارتها الكليـــــة: العلوم

عنوان الرسالة: Knowledge, Attitude and perceptions Towards climate change in Amman
المعرفة والاتجاهات لدى سكان عمان نحو التغير المناخي

اعلن بأنني قد التزمت بقوانين الجامعة الأردنية وأنظمتها وتعليماتها وقراراتها السارية المفعول المتعلقة باعداد رسائل الماجستير عندما قمت شخصيا" باعداد رسالتي وذلك بما ينسجم مع الأمانة العلمية وكافة المعايير الأخلاقية المتعارف عليها في كتابة الرسائل العلمية. كما أنني أعلن بأن رسالتي هذه غير منقولة أو مستلة من رسائل أو كتب أو أبحاث أو أي منشورات علمية تم نشرها أو تخزينها في أي وسيلة اعلامية، وتأسيسا" على ما تقدم فانني أتحمل المسؤولية بأنواعها كافة فيما لو تبين غير ذلك بما فيه حق مجلس العمداء في الجامعة الأردنية بالغاء قرار منحي الدرجة العلمية التي حصلت عليها وسحب شهادة التخرج مني بعد صدورها دون أن يكون لي أي حق في التظلم أو الاعتراض أو الطعن بأي صورة كانت في القرار الصادر عن مجلس العمداء بهذا الصدد.

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KNOWLEDGE, ATITUDE AND PERCEPTIONS TOWARDS CLIMATE CHANGE IN AMMAN

By
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COMMITTEE DECISION

This Thesis/Dissertation (Knowledge, Attitude and Perceptions towards Climate Change in Amman) was successfully defended and approved on 7-4-2011.

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DEDICATION

This dissertation is dedicated to my mother and father.

Thank you for who you are to me: Unconditional support, selfless expressions of love, generous contribution to others, and inspiration of all that is possible.

Moreover I wanted to dedicate this thesis also to my teacher Dr. Muna Abu Hindye, she was also behind my career and educational improvements, and she gave me the carriage, opportunity and support to continue. I learned a lot from you and always inspired by you. Thanks a lot.

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LIST OF ABBREVIATIONS

Symbol	**Description**
IPCC	Intergovernmental Panel on Climate Change
UNFCC	United Nations Framework Convention on Climate Change
GHG	Green House Gases
UNDP	United Nations Development Programme
WHO	World Health Organization
NSIDC	National Snow and Ice Data Centre
WTP	Willingness to Pay
CFCs	Chlorofluorocarbons
CO_2	Carbon dioxide
N2O	Nitrogen Oxide
SPSS	Statistical Analysis Software
ANOVA	Analysis of variance

KNOWLEDGE, ATTITUDE AND PERCEPTIONS TOWARDS CLIMATE CHANGE IN AMMAN

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ABSTRACT

There can be no effective and efficient solution to combat climate change if the societal understanding and perceptions toward it was not understood. Accordingly, this study aims to support decision makers and planners and to be a step towards awareness on climate change in Jordan. through providing the public awareness about the concept, causes and impacts of climate change; determining attitudes and perceptions towards climate change; uncovering the willingness to address and pay for climate change; and identifying the impact of different demographic, social and economic properties like gender, age, career and education on understanding the climate change issues.

The study uses a sample group response to a questionnaire about climate change issues. The researcher through reviewing recent scientific articles and books developed the questionnaire, which passed validity and reliability tests. After that, a random stratified cluster sample of people was selected from the community (Greater Amman Municipalities) at which 1200 questionnaires were disseminated. Of those questionnaires, 723 filled questionnaires were collected.

The results demonstrated 88% of the mean responses of the statements for the knowledge and understanding section are between 3.4-5. Represent good background knowledge and understanding of the issue and 78% of the mean responses of the statements pertain to perceptions and attitudes are between 3.4- 5. Reflect positive perceptions and attitude toward climate change. After analyzing these numbers. It appears that the studied population "Amman" would react favourably to mitigation policies. The results show that there are statistically significant variances among the respondent's knowledge and understanding attributable to age, gender, education and type of job. Regarding the perceptions and attitudes, apparently the study revealed that education is the only statistically significant variable in forming attitudes and perceptions. In terms of how the studied population acquire their knowledge, understanding, attitudes and perceptions about climate change; it was found that TV with 83.8%, Internet with 70.1%, newspapers with 49.8% and radio with 38.6% was the main sources of information, respectively.

Therefore; it is recommended that programs be initiated that specifically target young people (under 30), the unemployed, and women. With focusing on the role of governmental and nongovernmental organizations “NGOs” in initiating programs that highlights the causes, impacts and mitigations techniques more effectively.

INTRODUCTION

Natural processes are influencing the climate on the earth. Like volcanic activity, this is known to cause cooling of the surface temperature, also variations in solar activity. Such impacts are beyond human influence and will continue to affect the climate in the future. Yet there is also significant anthropogenic (human) climate change activity. In particular, the unusual increase in the concentration of greenhouse gasses in the atmosphere is mainly attributed to carbon dioxide from burning fossil fuels. The Fourth IPCC came up with solid conclusions that most of the global warming that has been observed over the last 50 years is attributed to human activities (Solomon et al., 2007). Such as burning fissile fuels, deforestation and various agricultural and industrial practices, land use change, dumping solid wastes and many other practices which lead to increasing the percentages of the Green House Gases (GHG).

It is not possible to make progress on defining dangerous climate change, or to develop sustainable responses to this global problem without recognizing the central role played by social and individual perceptions of the danger. As a result, there are two contrasting perspectives on dangerous climate change: `external' and `internal' definitions of risk. External definitions are usually based on scientific risk analysis of system characteristics of the physical or social world. Internal definitions of danger recognize that to be real, danger has to be either experienced or perceived – it is the individual or collective experience or perception of insecurity or lack of safety that constitutes the danger. A comprehensive policy response must appreciate both external and internal definitions of danger (Dessai, et al., 2004). Accordingly this study will investigate the internal definitions of risk to climate change which are perceived by individuals, since there is a wealth of literatures and studies on the external risk.

There can be no effective and efficient battle against climate change if we do not have the background of societal understanding - perceptions towards and knowledge of a problem (WHO, 2003). Accordingly, this study aims to support decision makers and planners and to be a step towards awareness on climate change in Jordan.

There are similar studies, for example in the U.K there are three articles focused on the barriers that members of the UK public perceive to engaging with climate change (Lorenzon et al., 2007). Seeking to determine whether climate change mitigation strategies are effective, researchers and policy-makers in the U.K typically use energy consumption as an indicator (Whitmarsh, 2008). Another survey in England and Wales assessed the reception and response of local government to the information being provided through the UK Climate Change Programme (Demerit and Langdon, 2004).

In the USA; there are three articles focused on exploring some determinants of willingness to pay (WTP) for climate change mitigation programs using a sample of 1,651 US households (Jaeseung Lee and Cameron, 2008). Another survey targeted 1,218 Americans, aimed at understanding the behavioural intentions to address global warming and the understanding of the causes of global warming (O'Connor, et al., 2000). A national, representative survey of the US public explored risk perceptions and policy preferences (Leiserowitz, 2006).

Due to the need for conducting an organized awareness campaign based on a situational analysis study, this research will be a basic reference in this field.

Study Questions:

1. What is the degree of the respondents' knowledge and understanding of the climate change concept, causes and effects?
2. To what extent do the respondents express their willingness to adapt to climate change?
3. Are there any significant differences in the degree of awareness of the respondent sample attributable to their gender, age, career or education?
4. Are there any significant differences in the degree of the respondent's attitude, perceptions and willingness to adapt to climate change, attributable to their gender, age, career or education?
5. What are the main sources of information about climate change for the respondents?

Objectives:

The objectives of this study include:

1. To identify perception about the concept of climate change for the studied Population, its impacts and causes.
2. To determine the attitude and perceptions for the studied population towards climate change, their willingness to address climate change, and their willingness to pay.
3. To identify the effect of different demographic, social and economic properties like gender, age, career and education on the study's questions.

CHAPTER ONE: LITERATURE REVIEW

This chapter provides a review of the relevant literature and is divided into six Parts: (1) knowledge and understanding of the climate change A. concept B. impact C. causes;(2) perceptions and attitude towards climate change issues A. responsibility toward climate change issue B. Readiness to adopt to climate change; (3) source of information about climate change; and lastly (4) climate change in Jordan.

1.1 Knowledge and Understanding

As international efforts to understand climate change reasons and impacts at the earth's surface are increasing over time, increasing evidence of anthropogenic influence on climate change has been found (IPCC, 2010).

Reviewing the literature for knowledge and understanding divides it into three subtitles: concept; impact; and causes of climate change.

1.1.1 Concept of Climate Change

The term "climate change" is sometimes used to refer specifically to the change in climate caused mainly by human activity. The United Nations Framework Convention on Climate Change (UNFCCC) defines it as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods" (UNFCC, 1994), while another definition does not relate directly the change on climate to human activities: "a change in the statistical properties

of the climate system when considered over periods of decades or longer, regardless of their statistical nature or physical causes" (National Snow and Ice Data Centre NSIDC, 2010). Accordingly, fluctuations in periods shorter than a few decades typically do not represent climate change.

At the Declaration of a meeting on climate change in New York on September 2007, the United Nations Secretary General Ban Ki-Moon referred to climate change as "…a serious threat to development everywhere. Indeed, the adverse impacts of climate change could undo much of the investment made to achieve the Millennium Development Goals. But it is not a zero-sum game. By being creative, we can reduce emissions while promoting economic growth. This is our opportunity to advance sustainable development, encourage new kinds of cleaner technologies, industries and jobs, and integrate climate change risks into national policies and practices" (UNDP, 2009).

The concept of Climate change includes the changing of the direction and magnitude of wind, Moreover it includes seasonal timing variations for example (IPCC, 2007)., some part of the world will face warmer and drier conditions and that will lead to a reduction in the length of the growing season.

1.1.2 Impacts of Climate Change

There are different impacts of climate change felt all over the world, as it affects or will affect agriculture, energy, human health, food security, the economy, and physical infrastructure (UNDP, 2009). Moreover it is considered as a social problem, as it is related to people's attitudes and is also defined as the human development issue of our

generation. The 2007 Human Development report acknowledges that climate change threatens to erode human freedoms and limit people's choices (UNDP, 2007).

Furthermore, the impacts of climate change will not be distributed evenly (Smith et al., 2001). Some regions and sectors are expected to face benefits while others will experience negatives. With greater levels of warming, it is very likely that benefits will decline and negatives increase (IPCC, 2007). Low-latitude and less-developed areas are especially vulnerable to the climate change risk (Schneider et al., 2007), so some agricultural regions will be threatened by climate change, while others may benefit. The impact on crop yields and productivity will therefore vary considerably. (UNFCC website).

Lettenmaier et al. (1994) indicated that the most important impacts of global warming would be those associated with changes in runoff and groundwater recharge. Higher water temperatures and changes in extremes, including floods and droughts, will affect the quality of water by polluting it with sediments, nutrients, dissolved organic carbon, pathogens, pesticides and salt, as well as thermal pollution, (IPCC technical paper, climate change and water, 2008).

Human health is also affected by climate change as Public health depends on "sufficient food, safe drinking water, secure shelter, good social conditions, and a suitable environmental and social setting for controlling infectious diseases". All of these factors can be affected by climate; and then reflected to human health negatively (IPCC, 2007).

In a study highlighting the impact of climate change on human health whereby in the year of 2000 it was reported that more than 150,000 deaths worldwide were caused of climate change impact. Moreover it shows that 88% of the disease fell upon children with the following health effects: “changing ranges of vector-borne diseases such as malaria and dengue; increased diarrheal and respiratory disease; increased morbidity and mortality from extreme weather; changed exposures to toxic chemicals; worsened poverty; food and physical insecurity; and threats to human habitation. Heat-related health effects for which research is emerging include diminished school-performance, increased rates of pregnancy complications, and renal effects”. (Sheffield and Landrigan, 2010).

Climate change may affect exposure to air pollutants by:”a) affecting weather and thereby local and regional pollution concentrations; b) affecting anthropogenic emissions, including adaptive responses involving increased fuel combustion for fossil fuel-fired power generation; c) affecting natural sources of air pollutant emissions; and d) changing the distribution and types of airborne allergens”. (Bernard. et al., 2001). Because of the association of climate change to increasing the risk of violent conflict in certain circumstances. It was called a ‘security’ problem, (Barnett and Adger (2007).

Climate change poses a potential threat to the earth’s biodiversity. (IPCC – climate change and biodiversity technical paper, 2002). In a literature assessment, Schneider et al (2007) concluded, with high confidence, that climate change would likely result in reduced diversity of ecosystems and the extinction of many species. Approximately 20-30% of plant and animal species assessed so far are likely to be at increased risk of extinction if increases in global average temperature exceed 1.5 to 2.5°C (IPCC, 2007).

Also other threats caused by changing the climate are food availability, stability, access and utilisation, decreased food security and increased vulnerability of poor rural farmers, especially in the arid and semi-arid tropics and Asian and African megadeltas, due to the changes in water quantity and quality due to climate. (IPCC technical paper, climate change and water, 2008).

1.1.3 Causes of Climate Change

There are many natural processes (called external forces) that influence the climate and, which include natural phenomena such as volcanic eruptions and solar variations that include volcanic activity. In addition, there are significant anthropogenic climate changes that result from human activity, particularly the unusual increase in the concentration of greenhouse gasses in the atmosphere, mainly carbon dioxide from burning fossil fuel. The Fourth IPCC came up with solid conclusions that most of the global warming that has been observed over the last 50 years is attributed to human activities (Solomon et al., 2007). Human-induced increases of atmospheric concentrations of gases such as carbon dioxide, methane, nitrous oxide and chlorofluorocarbons (CFCs) may result in unparalleled increases in global temperature (Houghton, 1995; Bush, 1997).

The Earth and atmosphere are heated by solar energy, which is balanced by the emission of thermal (long wave) radiation back into space. Atmospheric greenhouse gases (CO_2, CH_4, and N_2O) absorb thermal radiation from the surface and re-emit (upwards and downwards). The main man-made contributor to the increase in radiative heating is carbon dioxide, the concentration of which increased by 33% between 1958

and 2000. This is due principally to human activity through burning fossil fuels - coal, gas and oil. (IPCC, 2001)

Humans have unquestionably been the primary driver of the abrupt methane increase during the last 300 years. Human-related methane sources include livestock tending, rice irrigation, biomass burning, fossil-fuel extraction, and municipal land-fill construction (Ruddiman, W & Thomson, J, 2001).

A major component of the global climate system is the oceans; covering roughly 72% of the planet's surface, they have the thermal inertia and heat capacity to help maintain and ameliorate climate variability (Levitus et al., 2000). A recent observational study has shown that the heat content of the upper ocean has been increasing over the last 45 years in all the world's oceans, although the warming rate varies considerably among different ocean basins (Barnett et al, 2001). It shows that at least one global climate model, forced by a combination of observed and estimated anthropogenic gases, has reproduced the observed changes in ocean heat content with surprising accuracy.

Most people do acknowledge the role of CO2 caused by human activities on increasing the risk of climate change. However, research over the last decade has shown that other gases which are not well known to people are actually contributing about half of the overall increase in the green house radiative forcing on climate. Such as CFCs and other halocarbons. (Wuebbles, 1993). This may due to the fact that CFCs playing other role on destructing the ozone hole .While CFCs alone cause warming, their ozone destruction can cause cooling. So far these warming and cooling influences have approximately balanced (IPCC, 2007).

1.2 Perceptions and Attitudes

Climate scientists have acknowledged global warming as the most important environmental issue of our time, but it has taken over 20 years to be understood or perceived by the public in even the most superficial manner. Though there are differences between countries around the world in addressing this issue, no country has adequately reduced emissions or developed a base of public citizens sufficiently engaged on the problem. Researchers have identified that more effort must be put into raising the awareness of all related parties, whether at the governmental level, the private sector, or individuals (IPCC 2007).

Reviewing the literature on attitudes and perceptions will be divided into two subtitles: responsibility towards the climate change issue; and readiness to adapt to climate change.

1.2.1 Responsibility towards the climate change issue

In a report by Muller et al (2007), responsibility towards climate change was classified into two categories; the (moral) responsibility for climate impacts, and the (causally) responsibility. The key difference between being morally (partly) responsible for, and (causally) contributing to it is that the former is a blameable matter that only makes sense if the impacts are anthropogenic. Another type of classification mentioned in the same report was responsibility, namely strict (or unlimited) responsibility, and limited responsibility, which are based on, but different to, cumulative historic emissions of the greenhouse gases CO_2, CH_4 and N_2O (Muler et al, 2007).

Nowadays, Climate change is an issue of global environmental justice (IPCC 2007, because many countries who have contributed less to causing climate change are strongly affected by its adverse impacts, by looking back at the ‘‘no harm’’ principle and the ‘‘polluter pays’’ principle (Fussel, 2010).

Regarding the individual responsibility, as for their personal consumption individual ought to recognize the responsibility for their own contribution and to adjust their personal consumption to be in harmoney with both globally equitable and environmentally sustainable. (Lenzen, 1997).

1.2.2 Readiness to adapt to climate change

“The GHG concentration in the atmosphere would need to stay below the level of 450 parts per million (ppm) in order to prevent average global temperatures from rising by more than 20C above pre-industrial levels. This is widely considered the maximum allowable temperature increase to avoid irreversible damage to global climate and ecosystems”. (IPCC, 2007).

The concept of Climate Change Adaptation is an “adjustment in ecological, social or economic systems in response to observed or expected changes in climate stimuli and their effects and impacts in order to alleviate adverse impacts of change or take advantage of new opportunities. Adaptation can involve both building capacity, thereby increasing the ability of individuals or groups or organizations to adapt to changes, and implementing adaptation decisions, for example transforming the capacity into action” (IPCC, 2001).

In a study, Adger, et al., (2004) outlined a set of normative evaluative criteria for the purpose of judging the success of adaptations to climate change. It explains the elements of effectiveness, efficiency, equity and legitimacy, through a process by which adaptations are to be judged at different scales to involve new and challenging institutional processes.

Grothmann and Patt (2005) addressed the importance of measurable and alterable psychological factors in determining adaptation through developing a socio-cognitive Model of Private Proactive Adaptation to Climate Change (MPPACC). MPPACC separates out the psychological steps to taking action in response to perception, and allows one to see where the most important bottlenecks occur.

Societies can respond to climate change by adapting to its impacts and by reducing GHG emissions (mitigation). This can be done in different ways including: increasing awareness of climate change among policymakers and the public; and increasing the penetration of renewable energy technologies and the use of energy-efficient appliances (and this can be achieved by increasing consumer desire for more environmentally sound energy and for energy suppliers to take a hard look at using renewable energy to meet electricity supply requirements) (UNDP, Technology Needs Assessment for Climate Change, 2009).

To ascertain what citizens around the world understand about climate change, in the earliest major academic studies carried out by Bostrom, et al (1994), the study aims to assess American understanding of climate science by using the "mental model" approach. Whereby, the results show there is a "Widespread misinformation regarding

climate change in the general public, including confusion between ozone hole and global climate change and between weather and climate.” Additionally the study shows a confusion regarding causes of climate change: “automobile use, heat and emissions from industrial processes, aerosol spray cans, and pollution in general were frequently perceived as primary causes of global warming.”

Comparative international studies were published in 1998. (Bord, et al, 1998) Reviewed international survey data on public knowledge, concern, and perceived risk and “willingness to pay” regarding global warming. The study shows a widespread poor understanding of climate change in the public around the world, yet “a solid awareness of and support for general environmental goals” do exist along with some measure of awareness and concern regarding global warming, they also find. Similarly, in (2000 O’connor, et al) conducted a study aimed at finding the key determinant of behavioural intentions to address global warming. A survey was conducted which targeted 1,218 Americans. The key determinant was a correct understanding of the causes of global warming. Knowing what causes climate change, and what does not, is the most powerful predictor of both stated intentions to take voluntary actions and to vote on hypothetical referenda to enact new government policies to reduce greenhouse gas emissions.

More recently a national, representative survey in the US conducted on American citizens (Leiserowitz, 2006), revealing that Americans do have a good degree of climate change risk perceptions Influenced by psychological and socio-cultural factors. They additionally support national and international frameworks to combat climate change. In contrary they are not willing to pay for carbon consumption in their daily life. Finally

the study highlights on the theoretical distinction between analytic and experiential decision-making.

Lorenzon, et al., (2007) studied the barriers that members of the UK public perceive to engaging with climate change. Showing a number of common barriers emerge from the study, which operate broadly at ‘individual’ and ‘social’ levels. As for individual engagement tend to have significant reductions in greenhouse gases in the UK. The paper defines engagement as an individual’s state, comprising three elements: cognitive, affective and behavioural. They argued that targeted and tailored information provision should be supported by wider structural change to enable citizens and communities to reduce their carbon dependency.

1.3 Sources of information

Demerit and Langdon (2004) assessed the reception and response of local government to the information being provided through the UK Climate Change Programme in every Local Authority (LA) in England and Wales. Over three quarters of respondents (n = 184) the results revealed that the respondents felt they did not have access to the best information about the impacts of climate change on their areas. Although up-to-date information is freely available from a number of official Government sources, those official sources are not consulted as consistently as the media or as intensively as the internet, despite being consistently regarded as much more accurate, credible, and appropriate to Local Authority needs.

Americans’ most trusted sources of information about global warming are the “National Oceanic and Atmospheric Administration (NOAA) (78%), the National Science

Foundation (74%), scientists (72%), science programs on television (72%), natural history museums (73%), and science museums (72%)" (Leiserowitz et al, 2010).

1.4 Climate change in Jordan

Jordan is a Mediterranean country that depends mostly on rain as its main water resource. Recent years have witnessed a shortage of rainfall in different parts of the country (Walther et al., 2002). A recent study showed decreases in net primary productivity (NPP) and foliar projective cover (FPC) decrease over Jordan, primarily as a result of changes in herbaceous vegetation cover. Moreover it showed an increased incidence of fire, and runoff decreases over much of the country, although decreases in vegetation cover and hence water uptake by vegetation results in apparent increases in runoff in the region south of the Dead Sea. (RSCN, 2010).

These conditions are direct consequences of global climatic changes that have recently been affecting several locations, which are dramatically impacting wide ranges of ecosystems.

"In arid and semi-arid regions such as Jordan, changes in temperature will increase the evapotranspiration, reducing optimality of plants, and water stress that leads to a significant reduction of food production. This increases the risk of desertification in those areas, not to mention many bio-physical and social impacts. Furthermore, rising temperatures increases energy consumption for cooling. Mortality rates would also rise during the winter months and hot summers. Individuals in developed countries will be vulnerable to heat which increases by virtue of circulatory problems related to vascular and heart disease" (Hamdi et al., 2009).

Climate change is expected to make water resources even more scarce in countries such as Jordan which are already among the most water-scarce countries in the world, and will thereby contribute to even greater water stress in the region, particularly given the prevalence of Jordan to receive the refugees that continue to flood its borders and overuse its aquifers (Aburdeineh, 2008).

Within its efforts to reduce global-warming-producing gases, Jordan was among the first countries to sign the Climate Change Convention and adopt several measures in order to fulfil its commitment to this Convention. (Website of Statistical Economics and Social research and training centre for Islamic countries).

There are in Jordan many projects and studies aimed at mitigating the impacts of climate change. One of these projects, implemented in cooperation between WHO and UNDP, is related to public health adaptation to climate change, and aims to “increase adaptive capacity of national health system institutions, including field practitioners, to respond to climate-sensitive health risks”. (WHO website).

CHAPTER TWO: METHODOLOGY

This chapter describes the methodology used to pursue the research objectives of this study starting from population and sample selection, then developing the study tool (the questionnaire) and disseminating it. Moreover it describes the validity and reliability of this developed tool. Finally it explains the statistics used in order to analyze the data.

2.1 Study Subjects

Subjects of this study consisted of 723 adults in total, Selected on a stratified (working, not working), and clusters for the working subjects.

Selections of not working subjects achieved through personal communications with the Civil Service Bureau. Formal letter from the university was given to the responsible officer at the bureau (see annex 1), for facilitating the researcher's work. 400 copies of the questionnaires were delivered to the front desk officer their asking him to disseminate them randomly to those who accept to fulfil the questionnaire. In a five weeks period 286 questionnaires were filled and returned back to the researcher.

Regarding the working selections cluster sampling basis were considered as described in table (1) Field visits to these selected governmental and non-governmental organizations were conducted, at which a formal letter from the university was given to the head of the organization (see annex 1). This letter was intended to facilitate the researcher's work by explaining to the responsible person at the institution the purpose of the study and give him/her a group of questionnaires to disseminate to all the staff, regardless of their positions and titles. In total, 900 questionnaires were disseminated from which 437 questionnaires were filled and returned back to the researcher, this is

due to the fact that not all organizations returned the total number of questionnaires given to them.

Table (1) shows the list developed by the researcher representing the different clusters:

: Clusters1Table

Work status	Field of work	Targeted places to disseminate questionnaires
Not Working	N.A	Civil Service Bureau and others
Working	Social	1. National Council for Family Affairs 2. Ministry of Social Development 3. Jordan River Foundation
	Economic	4. Banks
	Professional	5. Industrial Zones.
	Environmental	6. Ministry of Environment. 7. Private sectors like Environmental consulting companies.
	Educational	8. Schools 9. Universities
	Cultural	10. Newspapers and magazines
	Health	11. Hospitals 12. Ministry of Health 13. Private sectors working in health sector such as Pharmaceutical and medical equipment companies

Table (2) below explains the sample social, economic and demographical characteristics:

Table 2: Characteristics

Variable	Frequency (number)	Percent
Age		
21 or less	141	19.5
21-30	355	49.1
31-40	124	17.2
41-50	61	8.4
51-60	27	3.7
61-more	15	2.1
Total	723	100.0
Gender		
Male	340	47.0
Female	383	53.0
Total	723	100.0
Education		
Elementary	30	4.1
Secondary	119	16.5
Bachelor	477	66.0
Post graduate	97	13.4
Total	723	100.0
Work		
Working	437	60.4
Not-working	286	39.6
Total	723	100.0
Field of work		
Social	40	8.8
Economic	149	33
Professional	62	13.7
Environmental	21	4.7
Educational	69	15.3
Cultural	10	2.2
Health	64	14.3
Other	36	8
Total	451	62.4

From Table (2), the results show that 49.9% of the studied sample was in the age group (21-30), 19.5% in the age group (20 or less), followed by 17.2% in the age group (31-40), 8.4% in the age group (41-50), 3.7 % in the age group (51-60) and 2.1% in the age group (61- more).

Regarding gender, 53% of the studied sample is female and 47% are male.

As for Education, 66% of the studied sample hold a bachelor's degree, 16.5% finished secondary school, 13.4% have post graduate, masters and PhD degrees, and 4.1% finished elementary school.

Regarding work, 60.4% of the studied sample is working and the rest (39.6%) are not working. On Table (2) when you compare the number of working respondents (437) with the total number of summation of all fields of work as stated on the Table (451), the differences of both numbers is due to the fact that there are two categories of respondents who are not working but answered the question about their field of work: (1) students (2) people who were working before in a certain field but they are currently not working. This causes the variation of both numbers.

Concerning field of work, 33% are working in the economic fields, 15.3% are working in education, 14.3% are working in health, 13.7% are working in professional services, 8.8% are working in the social field, 8% are working in other fields, 4.7% are working in the environmental field and the last 2.2% are working in the cultural field.

2.2 Study tool

A questionnaire was designed by the researcher utilizing reviewing many related scientific articles, books, websites and reports. The questionnaire consists of three main sections. The first section pertains to personal information such as age, sex, work, and education. These are the variables that will be studied and linked to the questions of the study in order to decide if there are any significant differences among the respondents' knowledge, attitudes and perceptions attributable to these variables.

The second section includes both open and closed ended questions. Closed questions consist of statements related to the concept of climate change, its impact and causes, plus statements to measure the understanding and perceptions of the respondents.

The respondent expressed his/her opinion about the statement and the degree to which he/she agrees or disagrees with the statement (answers are ranked 1-5; 1 is strongly disagree and 5 is strongly agree). After that the mean for each statement and for the total items calculated, after converting all negative statements which the right answer was to disagreeing with the statement to be all positives. Then it was agreed (see figure 1) if the mean is between 1 and 3.4, this would indicate low understanding of the statement by the studied sample. If the mean is between 3.4 and 5, this would indicate high understanding of the statement.

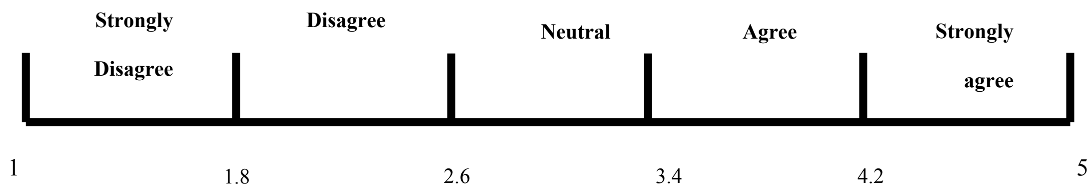


Figure 1: Study Tool scale

This Figure shows the scale of the study tool - as the length of the interval was 4/5 or 0.8, it was agreed to consider the respondents whose answers were between 3.4 and 5 (which represents “agree and strongly agree with the statements and therefore indicates high understandng of the statement). The mean was between 1 and 3.4,(which represent neutral, Disagree and Strongly Disagree) and therefore indicating low understanding of the statement by the respondents.

In relation to the open questions, the respondents were asked to list their response to three questions regarding the source of their information, their adaptation programs, and the kind of information they wish to know about climate change.

The third and last section contains multiple choice and open questions related to the resource of information for the respondents about climate change.

2.2.1 Validity of the Study Tool

To test the validity of the questionnaire, it was piloted by disseminating twenty questionnaires to twenty individuals representing different categories. Their feedback was considered and included in a second version of the questionnaire. After this pilot study, the questionnaire was presented to three experts in the field who reviewed the statements and questions. As a result, there were some statements deleted, others amended, and some statements moved from sections - all under the advice of the three experts. The final draft of the questionnaire (see annex no. 2) was disseminated to the study sample.

The second source of validity for this questionnaire is the construct validity, in which the total scores correlation – item score for each statement was calculated using Statistical Analysis Software "SPSS" Total correlation tells us the correlation between the statement and the scale of the subject that we are measuring.

Table (3) and (4) contain total correlation item for each statement:

Table 3: Knowledge and Understanding

Statements	Corrected Item-Total Correlation
The World Climate is changing	0.255
Climate Change is the result of human behavior	0.362
There are positive impacts for Climate Change	0.213
The effects of Climate Change will be the same everywhere	0.105
Fossil fuel burning (petrol, gas, coal), increases the Climate Change problem	0.424
Climate Change includes increasing or decreasing temperatures	0.294
Climate Change includes changes in precipitation percentages	0.405
Climate Change includes changing the direction and magnitude of the wind	0.317
Climate Change includes seasonal timing variation	0.235
Climate Change may lead to the extinction of some animal species	0.455
Climate Change affects human beings health negatively	0.430
Climate Change positively affects animal's health	0.003
Climate Change increases air pollution	0.401
Climate Change leads to an increase in contagious diseases	0.434
Climate Change increases sea levels	0.365
Climate Change causes more violence in communities	0.267
Climate Change is a problem which threatens human life	0.465
Climate Change increases epidemiological diseases in communities.	0.438
Climate Change increases hurricanes	0.504
Climate Change demands more financial commitments from countries	0.445
CO2 is considered as the main contributor to the Climate Change phenomenon	0.430
Climate Change leads to of biodiversity loss	0.477
Cutting down trees increases Climate Change problems	0.417
Change in land use from agricultural to urban increases the problem of Climate Change	0.443
Climate Change threatens economic investments	0.425

Table 4: Attitudes and Perceptions

Statements	Corrected Item-Total Correlation
Climate Change is a major issue in my life	0.456
I can help in my personal capacity to limit the effects of Climate Change	0.474
I think that there is a global understanding of the risks associated with Climate Change	0.242
I think that the Climate Change problem is the largest problem facing humanity since its beginning	0.334
Government is the only responsible body for Climate Change	0.031
I think that the government should be as concerned about Climate Change issues as it is with the economic crisis	0.371
I personally care as much about Climate Change as I care about the economic crisis	0.461
I think that there is still a chance that Climate Change won't happen.	0.136
Rationalizing my use of the non – renewable energy (petrol, coal and gas) will limit the adverse impacts of Climate Change	0.420
Using the renewable energy (sun, wind and waves) will limit the adverse impact of Climate Change	0.361
Adaptation to Climate Change is required	0.231
I have the willingness to pay for the cost of Climate Change adaptation	0.350
I will work on changing my behavior to contribute to limiting the adverse impact of Climate Change	0.511
Adaptation to Climate Change includes enhancing the drainage systems	0.388
Adaptation to Climate Change includes building dams	0.354
Community's adaptation to Climate Change decreases the adverse impacts on it	0.343
Adaptation to Climate Change includes buildings design to be adequate to cope with it	0.353
We are all partners in the responsibility to alleviate the negative effects of Climate Change	0.517
Turning on lights does not increase the problem of Climate Change	0.114
I agree to pay a certain amount of money within the electricity bill for example, in order to mitigate the negative effects of Climate Change	0.299
Increased energy consumption leads to increased adverse impacts of Climate Change	0.459
In order to minimize the adverse impact of Climate Change, a new clean energy must be sought such as solar and wind	0.486
In order to minimize the adverse impact of Climate Change we should work on increasing the green areas	0.402

The above two tables (3) and (4) show that the total correlation value for the two sections (“knowledge and understanding” and “attitudes and perceptions”) are positive and statistically significant indicating construct validity of the questionnaire.

The statement with the least value at the knowledge and understanding scale is, “Climate change affects positively animal’s health”, with a correlation coefficient value of 0.003. For attitude and perceptions the smallest value is “government is the only responsible body for climate change’, with a correlation coefficient of 0.031. This reflects weak correlation between the statement and the scale of the subject that we are measuring, or that the response of the respondents was scattered randomly. This may relate to the fact that they do not have any information about this question or did not understand it.

2.2.2 Reliability of the study tool

The Reliability Coefficient (*Cronbach's Alpha*) was calculated for each classified category in the questionnaire. Empirically, however, alpha can take any value between 0-1. Higher values of alpha are more desirable. As a rule of thumb, require a reliability of 0.70 or higher (obtained on a substantial sample) before they will use an instrument, Furthermore, the appropriate degree of reliability depends upon the use of the instrument.

Cronbach's alpha will generally increase as the intercorrelations among test items increase, and is thus known as an internal consistency estimate of reliability of test scores. Because intercorrelations among test items are maximized when all items

measure the same construct, Cronbach's alpha is widely believed to indirectly indicate the degree to which a set of items measures a single unidimensional latent construct.

Table 5: Reliability Statistics

Concept	
Reliability Coefficient	No. of Items
0.803	26
Impact	
0.762	21
Causes	
0.737	4
Responsibility	
0.759	6
Readiness	
0.708	11
Attitude, perception	
0.795	23
Perception	
0.674	8

All of the reliability coefficients were above 0.6 that means it is all statistically acceptable. This indicates that the internal consistency for the questionnaire's subtitles is excellent.

2.3 Used Statistics

In order to know the knowledge and understanding, perceptions and attitudes studied sample, SPSS software was used to all the statistics on this study the mean was calculated for each statement In order to identify significant variables among the studied sample in their understanding, attitude and perceptions that are attributable to the variables, a t-test has been deployed for the variables that contain two independent variables (for example, gender and work status). For the variables that contain more than two variables ANOVA technique was deployed to check whether there are significant differences among groups. Following the ANOVA, a post hoc test and Tukey HSD (Honestly Significant Difference) were deployed which is a single-

step multiple comparison procedure and statistical test generally used in conjunction with an ANOVA to find which means are significantly different from one another.

CHAPTER THREE: RESULTS AND DISCUSSION

In order to answer the questions and objectives of the study, a questionnaire was used by the researcher. This questionnaire was divided into two categories; knowledge and understanding and Attitudes and perceptions. This was done to obtain a comprehensive idea if the respondents views on climate change. The categories were further divided into:

Knowledge and Understanding

1. Studied population understanding of the climate change concept.
2. Studied population understanding of climate change impacts.
3. Studied population understanding of climate change causes.

Attitudes and Perceptions

4. Studied population point of view as to upon who lays the responsibility for climate change issues.
5. The readiness of the studied population in addressing climate change through adopting actions.

Results are discussed with their possible meaning to research question in order to come up with conclusions.

3.1 Knowledge and Understanding

After analyzing the data, tables (6) (7) are constructed that include the mean for each statement. Table (6) includes statements related to knowledge and understanding and answers the following question of the study:

- "What is the degree of awareness of the respondents to climate change concept, causes and effects?

It furthermore achieves the following objective of the study:

- Identify the concept of climate change for the studied population, its impact and causes.

Table 6: Knowledge and Understanding

Statements	No. Of respondents	Mean of the respondents to the statements "level of understanding"	Std. Deviation
The world climate is changing	723	4.49	0.675
Climate change is the result of human behaviour	723	4.30	0.813
Burning fossil fuels (petrol, gas, coal), increases the climate change problem	723	4.20	0.819
Changing land use from agricultural to urban increases the problem of climate change	723	4.17	0.899
Cutting down trees increases climate change problems	723	4.16	0.893
Climate change affects human beings health negatively	723	4.08	0.861
Climate change includes increasing or decreasing temperatures	723	4.03	0.828
Climate change demands more financial commitments from countries	723	3.97	0.870
Climate change includes changing on the precipitation percentages.	723	3.93	0.901
CO2 acts as the main contributor to climate change	723	3.92	0.887
Climate change may lead to the extinction of some animal species	723	3.90	0.849
Climate change leads to increasing of contagious disease	723	3.87	0.928
Climate change increases epidemiological diseases in communities	723	3.83	0.918
Climate change leads to loss of biodiversity	723	3.79	0.849
Climate change includes seasonal timing variation	723	3.79	0.929
Climate change poses a threat to economic investments	723	3.75	0.942
Climate change includes changing of the direction and magnitude of the wind	723	3.74	0.884
Climate change is a problem which threatens human life	723	3.71	1.028
Climate change increase the sea levels	722	3.71	0.952
Climate change increases hurricanes	722	3.65	0.887
Climate change leads to maximizing air pollution	723	3.60	1.021
The effects of climate change are the same everywhere	723	3.54	1.030
Climate change affects animal's health positively	723	3.19	1.112
Climate change causes more violence in communities	723	3.11	1.039
There are positive impacts of climate change	723	3.10	1.101
- cumulative	723	3.83	0.379
Valid N (list wise)	722		

The cumulative mean for all this section was 3.83. This reflects good background knowledge of the studied sample on the concept of climate change and its causes and impacts. Moreover it shows that there is a general consensus about i) the fact that the world climate is changing; ii) the main reason behind this change is human behaviour and activities such as burning fossil fuels, cutting down trees, and changing land use; and iii) they relate the concept of climate change to increasing or decreasing temperatures, changing the precipitations percentages, changing the wind directions and magnitudes, and the seasonal timing variation.

Table (6) demonstrates that the studied population have a clear understanding of the impacts of climate change evidenced by the cumulative mean is 3.63, which are high values. The statement with the highest mean is “climate change has adverse impacts affecting human health”, followed by “climate change leads to retardations of agricultural products” then “climate change demands more financial commitments from countries”. This suggest that people understand the impacts relating to health food, economics and politics

Concerning the studied sample understanding of the cause of climate change, the mean for all statements is 3.82; reflect excellent understanding of climate change causes. “Changing in land use from agricultural to urban increase the problem of climate change” got the highest mean of 4.17, followed by “Cutting down trees increases climate change problems” with 4.16 mean, then “CO2 is the main factor contributing to the climate change phenomenon” with 3.92 mean, and lastly “Turning on the lights does not increase the problem of climate change” had a 3.04 mean. This means that the

respondents aware of large causes of climate change but less aware of effects of every daily practices. Or they judge these causes as contributing less to the climate change.

These statements in Table (6) represent the brunt of the climate change argument stressed by scientists and politicians today. This demonstrates that knowledge and understanding is high, yet also highlights the quality of knowledge. This is further strengthened through the quality of awareness programs and personal initiatives mentioned (see appendix four).

These above mentioned numbers compare favourably with a Leiserowitz et al (2010) study that assessed American understanding about how the climate system works, and the causes, impacts, and potential solutions to climate change. The study found that 63 percent of Americans believe that global warming is happening, but many do not understand why.

3.2 Attitudes and Perceptions

Table (7) contains statements related to attitudes and perceptions for the studied sample, answering the following study questions:

- To what extent do the respondents express their willingness to adapt to climate change?

And achieving the following study objective:

- Determine the attitude and perceptions of the studied population towards climate change, their willingness to address climate change, and their willingness to pay.

Table 7: Attitudes and Perceptions

Statements	No. Of respondents	Mean responses to the statements	Std. Deviation
In order to minimize the adverse impact of climate change we should work on increasing the green areas	723	4.31	0.761
In order to minimize the adverse impact of climate change, a new clean energy must be used, such as solar and wind.	723	4.28	0.781
We are all partners in the responsibility to alleviate the negative effects of climate change	723	4.19	0.838
Using renewable energy (sun, wind and waves) will limit the adverse impact of climate change	723	4.15	0.861
I think that governments should be concerned with climate change issues as it concerns the economic crises	723	4.06	0.943
I think that there is still a chance that climate change will not happen.	723	4.06	1.050
Rationalizing my use of non – renewable energy (petrol, coal and gas) will limit the adverse impacts of climate change	723	3.96	0.913
Adaptation to climate change is required	723	3.92	0.855
Adaptation to climate change includes buildings designed to be adequate to cope with climate change	723	3.91	0.853
Community's adaptation to climate change decreases the adverse impacts on it	723	3.90	0.858
Climate change is a major issue in my life	723	3.86	0.995
Adaptation to climate change includes building dams	723	3.82	0.849
I think that there is a global understanding of risk that climate change will lead to	723	3.81	1.019
Adaptation to climate change is required	723	3.80	0.915
Increased energy consumption leads to increased adverse impacts of climate change	723	3.79	0.948
Adaptation to climate change includes enhancing the drainage systems.	723	3.64	0.861
I can help in my personal capacity to limit the effects of climate change	723	3.59	1.031
I personally care about climate change as I care for the economic crisis	723	3.58	1.037
I think that climate change problem is the largest problem humanity has faced since its beginning	723	3.37	1.107
Government is the only responsible body for climate change	723	3.15	1.230
I have the willingness to pay for the cost of climate change adaptation	723	3.10	1.178
Turning on the lights does not increase the problem of climate change	723	3.04	1.142
I agree to pay a certain amount of money within the electricity bill (for example), in order to mitigate the negative effects of climate change	723	2.94	1.305
Attitudes, perceptions - cumulative	723	3.75	0.418
Valid N (list wise)	723		

The cumulative mean for all statement was 3.75, which reflects the positive perceptions and attitudes for the studied sample towards climate change issues and willingness to address this problem and share the responsibility.

Regarding the point of view for the studied sample as to where the responsibility lies for climate change issues it appears that the studied sample claims some responsibility for alleviating the negative effects of climate change, as 85.7% agree with the statement, “we are all partners in the responsibility to alleviate the negative effects of climate change”. However, 46.6% agree with the statement that “government is the only responsible body about climate change”.

Regarding the studied sample’s readiness to adopt actions addressing climate change, the total mean for all statements was 3.63, which reflect a moderate readiness to adopt actions addressing climate change. For example a large majority of the respondents understand correctly understand that “rationalizing my use of the non – renewable energy (petrol, coal, and gas) will limit the adverse impacts of the climate change” evidenced by the mean response of the statements being 3.96, and also correctly understand that “in order to mitigate the negative impacts of climate change a new clean energy must be sought such as solar and wind” evidenced by the mean response of the statements being 4.28. Moreover correctly understand that “in order to minimize the adverse impact of climate change we should work on increasing the green areas” evidenced by the mean response of the statements being 4.31. However, the studied sample does not have the willingness to pay for the climate change adaptation plans. As 43.3% respondents agree with the statement “I have the willingness to pay for the cost

of climate change adaptation programs” and just 40.9% of the respondents agree with the statement “I agree to pay certain amount of money within the electricity bill for example, in order to mitigate the negative effects of Climate Change”. These two statements got the lowest percentages of agreement by the respondents.

This indicates that they still need awareness to understand certain practices in their daily life and how they can help in mitigating the negative impacts. However, the results also show that a few of them are willing to pay or share any responsibility in paying for this problem, and this percentages about willingness to pay is understood, since the economic situation, poverty and unemployment, all these factors may lead to this low percentages, in addition 46.6% of the respondents consider that government is the only responsible body for climate change so these respondents will not share responsibility by paying to it.

This is consistent with (Lee and Cameron, 2008) study that demonstrated people are more willing to pay for climate change mitigation through energy taxes. Their study also demonstrated that willingness to pay is greater when costs are understood to be shared internationally rather than being borne mostly by a country group including the US. In addition, people are generally more willing to pay for climate change mitigation if they believe that the harm caused by climate change impacts will be substantial, rather than just moderate.

Lorenzon, et al., (2007) studied the barriers that members of the UK public perceive to engaging with climate change. It draws upon three mixed-method studies, with an emphasis on the qualitative data that offer an in-depth insight into how people make

sense of climate change. The paper defines engagement as an individual's state, comprising three elements: cognitive, affective and behavioural. A number of common barriers emerge from the three studies, which operate broadly at 'individual' and 'social' levels. These major constraints to individual engagement with climate change have implications for achieving significant reductions in greenhouse gases in the UK. They argued that targeted and tailored information provision should be supported by wider structural change to enable citizens and communities to reduce their carbon dependency.

The studied population "Amman" appear to have a correct understanding of both individual and social levels identified above. The individual drive appears to be evident; however the main barrier appears to be social as the majority of responses deemed responsibility as "shared". Therefore, the studied population would appear to benefit from similar tailored and targeted information provisions that would promote a broader understanding of the subject.

In an open question, the respondents were asked to mention three actions or programs to adapt to climate change figure (1) summarizes the final results:

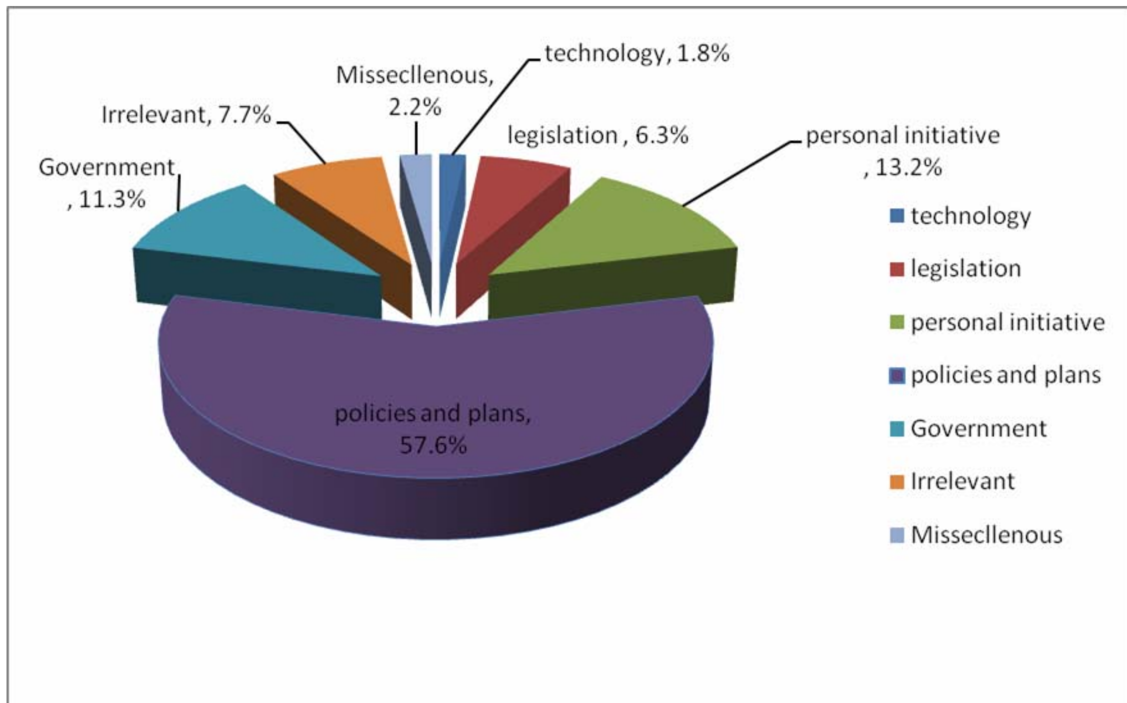


Figure 2: Actions to Adapt to Climate Change

This figure shows the respondents suggestions for actions to adapt to climate change, after classifying data into below categories. This percentage indicates the weight for each category based on the total frequencies of each program.

In an open question the respondents were asked to mention three actions or programs to adapt to climate change. After gathering the results, the researcher with cooperation with an expert on this field worked on categorizing and weighing each category based on the frequencies. And this process was completed with an agreement of 95% between the researcher and the expert. This gives the validity for this process.

The results shows that; 57.6% of the respondents see the programs should be developed through adopting policies(1), the suggested program with the highest frequency was

[1] The term policy may apply to government, private sector organizations and groups, and individuals. Presidential executive orders, corporate privacy policies, and parliamentary rules of order are all examples of policy

encourage the use of renewable energy, conduct awareness campaigns, and intensify studies and research in this field; 13.2% of the respondents see that the programs should be initiated personally like rationalizing the use of non-renewable energy and the pollutants that increase the problem of climate change; 11.3% of the respondents see that the programs should be implemented by government – they suggested programs such as allocating a budget for climate change adaptation purposes and developing adaptation plans at the National level and in cooperation with other countries; 7.7% of the answers were irrelevant to the issue like acquisitions of conditioners, using fans, reducing working hours and using suitable clothes according to the weather conditions; 6.3% of the respondents see that by amending the legislations to impose stricter sanctions on everyone who increases the pollutants which cause climate change and imposing penalties for any violation caused by any factory or company. 1.8 % of the respondents see that the programs should be based on technology such as using hybrid cars and inventing new machines runs by solar energy.

From the above analysis apparently the respondents claim responsibility in adapting to climate change and have good ideas about the issue and how to mitigate it. It is also clear that there are misconceptions as 7.7% of the sample suggested irrelevant actions such as portable air conditioners for each person, resort to swimming pools, raise salaries and human endurance.

From the above mentioned results. Apparently we can conclude that there are misconceptions in understanding the issue and linking it to daily life practices and how the respondents can mitigate the impacts of climate change, which should be highlighted in future interventions programs.

3.3 Attitudes and Demography

Table (8) addresses awareness of climate change attributable to socio-economic variables. Specifically, it answers the following study questions:

- Are there any significant differences in the degree of awareness of the respondents attributable to their gender, age, career or education?
- Are there any significant differences in the degree of the respondents' willingness to adapt to climate change attributable to their gender, age, career or education?

The following study objective is also achieved in this section:

- Identify the impact of different demographic, social and economic properties (like gender, age, career and education) on all of the questions the study is addressing.

3.3.1 Age

The table below indicates that there are variances among the respondents for different age groups on their acquired knowledge about climate change and their perceptions and attitudes.

Table 8: Knowledge of Climate Change by Age

		No. Of respondents	Mean of responses to the statements
Knowledge and understanding	20 or less	141	3.74
	21-30	355	3.81
	31-40	124	3.92
	41-50	61	3.90
	51-60	27	3.89
	61- more	15	3.92
	Total	723	3.83
Attitude, perceptions	20 or less	141	3.78
	21-30	355	3.70
	31-40	124	3.78
	41-50	61	3.83
	51-60	27	3.78
	61- more	15	3.90
	Total	723	3.75

Respondents between the ages of (31-40) and (61-more) acquired best knowledge and understanding about climate change concept, impacts and causes of climate change, evidenced by the mean response of the statements being 3.92 for both mentioned age groups. But further tests will be deployed in order to make sure that the differences with the rest age groups are significant or not. Concerning attitude and perceptions the ages of (61 and more) have the most positive attitude and perceptions, willingness to address, holding responsibility toward climate change issues, evidenced by a mean of 3.90.

An "ANOVA test" has been calculated ANOVAs to compare three or more means to decide whether there are significant variances or not, followed by Tukey's HSD (Honestly Significant Difference) in order to find which means are significantly different from one another.

From both tests (see Annex 6, Tables 15 and 16) the following is concluded: it is concluded that there is significant variance with the respondents' understanding attributable to their age on their understanding of the concept, impacts, causes, as the values of the significant variance are less than .05.

The significant variances in the respondents' understanding of the concept of climate change section are between the following age groups:

- (21 or less) and (31-40)
- (21-30) and (31-40)

This shows that peak knowledge acquired between age of 31-40, and possibly weaknesses in the knowledge of climate change of young people. And that the climate change understanding, are dependent on the age groups at this studied sample.

Concerning attitudes and perceptions toward climate change issues, there are positive attitudes among all age groups. So there are no variances in this part of the study

This raises two issues. Firstly, the age group (31- 40) are more likely to hold postgraduate degrees and have more experience in life and work and are more interested to read news papers and watch TV news, which may be their source of information about the topic. Secondly, it suggests that curricula in secondary schools and undergraduate degree may not be paying sufficient attention to climate change. (Leiserowitz et al, 2010) show that large majorities of Americans say that schools should teach our children about the causes, consequences, and potential solutions to global warming (75%) and that the government should establish programs to teach Americans about the issue (68%). As education becomes higher, even more significant

differences in post-graduate and bachelor knowledge and understanding of climate change is observed.

3.3.2 Gender

Table (11) explains that there are differences among the studied sample attributable to their gender.

Table 9: T-Test, Gender

	gender	N	Mean	Std. Deviation	Std. Error Mean
Knowledge and understanding	Male	340	3.86	0.380	0.021
	female	383	3.80	0.375	0.019
Attitude, perceptions	Male	340	3.76	0.411	0.022
	female	383	3.74	0.425	0.022

From Table (11), it appears that males acquire more knowledge about concept, impact, causes of climate change evidenced by a mean of 3.86 for males and 3.80 for females in knowledge and understanding. Furthermore males are more responsible, having more positive attitudes and perceptions toward climate change issues and ready to adopt actions addressing climate change, evidenced by a mean of 3.76 male and 3.74 females. However Independent T-tests will be deployed in order to check whether there are significant differences between both genders on their awareness, perceptions and attitude toward climate change issues or not.

Table 10: Sample T-test, Gender

		t- test	df (degree of freedom)	Sig. (2-tailed)
Equal variances assumed	Knowledge and understanding	2.214	721	0.027
	Attitude, perceptions	0.466	721	0.641

From the above table it is clear that there are significant differences between males and females just on their awareness of the concept, impacts and causes of climate change, evidenced by the significant degree of 0.027 which is less than .05. While it is not significant in their perceptions and attitudes, as the significant degree is more than .05 it is .641.Although on the knowledge and understanding the results show statistically significance, the actual difference is just 0.08 which means that practically they are nearly on the same level of understanding the issue.

McCright (2010) found that women in the US convey greater assessed scientific knowledge of climate change than do men. Consistent with much existing sociology of science research, women underestimate their climate change knowledge more than do men. Also, women express slightly greater concern about climate change than do men, and this gender divide is not accounted for by differences in key values and beliefs or in the social roles that men and women differentially perform in society. Modest yet enduring gender differences on climate change knowledge and concern within the studied population general public suggest several avenues for future research and programs, which are explored in the conclusion. Especially that we have to acknowledge the central role played by women in their households and communities in mitigating the risk of climate change.

Despite recognizing the differential effects of climate change on health of women and men as a consequence of complex social contexts and adaptive capacities, the study finds gender to be an underrepresented or non-existing variable both in research and studied policy documents in the field of climate change and health (Preet et al, 2010). Whereas the concepts of class, poverty and race make regular appearances in social

scientific analyses of global climate change, the same cannot be said for gender. A survey of the academic literature suggests that there is a lack of research into the many gender dimensions of climate change. The small amount of gender-sensitive work that exists has been carried out by gender, environment and development (GED) researchers working for the UN and non-governmental organisations who focus almost exclusively on the material impacts of climate change on vulnerable women in the Global South. In this paper MacGregor (2010) made two arguments about the current state of research on gender and climate change. First, he argues that although the GED research makes many important contributions to our understanding of the politics of climate change, it also contributes to an unnecessarily narrow understanding of gender, a fixation on 'impacts' that are material and measurable, and the view of women in the developing world, particularly those living in countries of the Indian Ocean Region, as victims of ecological crisis. Second, in response to these shortcomings, he argues for the development of a deeper gender analysis where materialist-informed empirical research on women is complemented by critical feminist theorising of the discursive constructions and categories that shape climate politics today.

While underscoring the vulnerability of poor women to climate change, it should also be acknowledged that women play an important role in supporting households and communities to mitigate and adapt to climate change. Across the developing world, women’s leadership in natural resource management is well recognized. For centuries, women have passed on their skills in water management, forest management and the management of biodiversity, among others. Through these experiences, women have acquired valuable knowledge that will allow them to contribute positively to the identification of appropriate adaptation and mitigation techniques, if only they are given

the opportunity (UNDP, 2009).it concluded that women should be empowered and given the opportunity to share the responsibility in adapting and mitigating the impact of climate change.

3.3.3 Education:

Table (11) shows the results of the respondents' answers taking into consideration their level of education.

Table 11: One-Way Test, Education

Descriptive

		No. Of respondents	Mean response to the statements	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
Knowledge and understanding	elementary	30	3.69	0.471	0.086	3.51	3.86
	secondary	119	3.85	0.419	0.038	3.78	3.93
	bachelor	477	3.80	0.349	0.016	3.77	3.83
	post graduate	97	3.95	0.406	0.041	3.87	4.04
	Total	723	3.83	0.379	0.014	3.80	3.85
Attitude, perceptions	elementary	30	3.70	0.521	0.095	3.51	3.90
	secondary	119	3.80	0.421	0.039	3.72	3.88
	bachelor	477	3.71	0.396	0.018	3.67	3.75
	post graduate	97	3.89	0.451	0.046	3.80	3.98
	Total	723	3.75	0.418	0.016	3.72	3.78

From Table (11) it appears that the respondents with post graduate studies have better knowledge, perceptions and attitudes toward climate change issues, but not necessary in a significant value. ANOVA test has been calculated in order to test whether this variance is significant or not regarding the education level and whether it is attributable to the knowledge, attitudes and perceptions toward climate change issues. Followed by Tukey's HSD (Honestly Significant Difference) in order to find out which means are significantly different from one another.

From both tests (see Annex 6, Tables 17 and 18) it appears that there are significant variances attributable to education for the respondents' knowledge, attitudes and perceptions toward climate change, due to extremely low (below .05) significant value which is 0.000 at knowledge and understanding and 0.001 at attitude and perception.

In addition, the significant variances on the respondents' understanding and perceptions toward climate change were between the following education levels:

- Elementary and post graduate
- Bachelor and post graduate

And for Attitudes and Perceptions:

- Bachelor and post graduate

This demonstrates the intensity and specificity of the post graduate programs. The level of knowledge, understanding, attitudes, and perceptions are highest at the post graduate level and are significantly greater than any level attained at both elementary and bachelor levels. It further emphasizes the importance of education on perceptions and attitudes toward climate change. Environmental education is the key to providing people with the knowledge, awareness, attitudes and values that will assist them in this task (Teodorescu and Oros, 2010). While there is emerging awareness of the current and potential impacts of climate/environmental change on education provision and learning, it is also clear that education – formal and non formal, from primary through to tertiary and adult education – has an important role to play in addressing this change (Bangay and Blum, 2010).Finally it can be concluded that programs should be initiated targeting younger people on their secondary and undergraduate studies.

3.3.4 Work Status

Table (12) explains that there are differences among the studied sample attributable to their work status whether they are working or not.

Table 12: Working or Not

	work	No. Of respondents	Mean	Std. Deviation	Std. Error Mean
Knowledge and Understanding	working	437	3.87	0.386	0.018
	not working	286	3.77	0.361	0.021
Attitude, perceptions	working	437	3.77	0.411	0.020
	not working	286	3.72	0.428	0.025

Apparently working respondents acquire more knowledge evidenced by a mean of 3.87 for working and 3.77 for non working at the knowledge and understanding about climate change, impacts and causes. Moreover they have positive attitudes and perceptions toward climate change issues, evidenced by a mean of 3.77 for working and 3.72 for not working respondents at attitudes and perceptions section.

This is most likely due to higher education of employed people or possibly more exposed to information sources.

A t-test was calculated to check whether this variance for the work status among the respondents is significant or not.

Table 13: Independent Test, Working or Not

		t- test	Degree of freedom	Sig. (2-tailed)
Equal variances assumed	Knowledge and understanding	3.483	721	0.001
	Attitude, perceptions	1.432	721	0.153

It is clear that there are significant variances as the value 0.001 is below 0.05 between working and not working respondents on their understanding of the concept, impacts,

and causes of climate change and this was expected. But concerning the responsibility, readiness, attitude and perceptions toward climate change the differences among the respondents with different working status are not significant, it is 0.153 that is more than 0.05.

3.3.5 Work Field

In relation to work field and the respondents' understanding, attitudes and perception toward climate change.

Table 14: Descriptive Stats, Work Field

		No. Of respondents	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
Knowledge and understanding	social	40	3.90	0.503	0.079	3.74	4.06
	economic	149	3.82	0.366	0.030	3.77	3.88
	professional	62	3.90	0.346	0.044	3.81	3.99
	environmental	21	4.10	0.332	0.073	3.94	4.25
	educational	69	3.84	0.416	0.050	3.74	3.94
	cultural	10	3.87	0.428	0.135	3.57	4.18
	health	64	3.82	0.370	0.046	3.72	3.91
	other sectors	36	3.92	0.316	0.053	3.81	4.02
	Total	451	3.86	0.385	0.018	3.83	3.90
attitude, perceptions	social	40	3.77	0.431	0.068	3.63	3.91
	economic	149	3.74	0.413	0.034	3.67	3.81
	professional	62	3.83	0.456	0.058	3.71	3.94
	environmental	21	3.91	0.384	0.084	3.74	4.09
	educational	69	3.73	0.400	0.048	3.63	3.82
	cultural	10	3.60	0.375	0.119	3.33	3.87
	health	64	3.71	0.392	0.049	3.62	3.81
	other sectors	36	3.80	0.361	0.060	3.68	3.92
	Total	451	3.76	0.411	0.019	3.72	3.80

Table (14) demonstrates that the respondents working in the environmental sector got the highest mean on all sections: concept, impacts and causes of climate change responsibility, readiness, attitudes and perceptions toward climate change issue, which is expected. But further tests will be deployed in order to decide the significance of these differences.

An ANOVA test is performed for the above data to measure whether these variances in knowledge, attitudes and perceptions toward climate change among the respondents regarding the field of work are significant or not.

From the test (see Appendix 6, Table 19), there are no significant variances for the respondents' knowledge and understanding nor are their perceptions or attitudes significantly attributable to their field of work. Since both significant values are above 0.05, which are 0.097 and 0.325 respectively.

It is interesting that the respondents working in environmental fields acquire better knowledge than respondents in other working categories but not to a significant degree. Additionally respondents working in environmental fields also have better perceptions and attitudes but not in a significant degree compared to theirs. This reflects the interest of all categories on this important topic - as we are in Jordan all can observe the impacts of this problem and the differences in climatic conditions these days. But clearly climate change is a hot topic that concerns all people regardless of their age, education, gender and backgrounds. This was obvious from the results of the study.

In conclusion, this study revealed that the studied population have significant differences in demographic variables, which in harmony with a results of a study conducted by Leiserowitz (2006), found that Public risk perceptions of climate change appear to correspond more strongly with demographic, ideological, identity, and institutional trust variables.

3.4 Sources of Information

Respondents stated (Figure 3) that the following resources are the main ones that provided them with information about climate change issues:

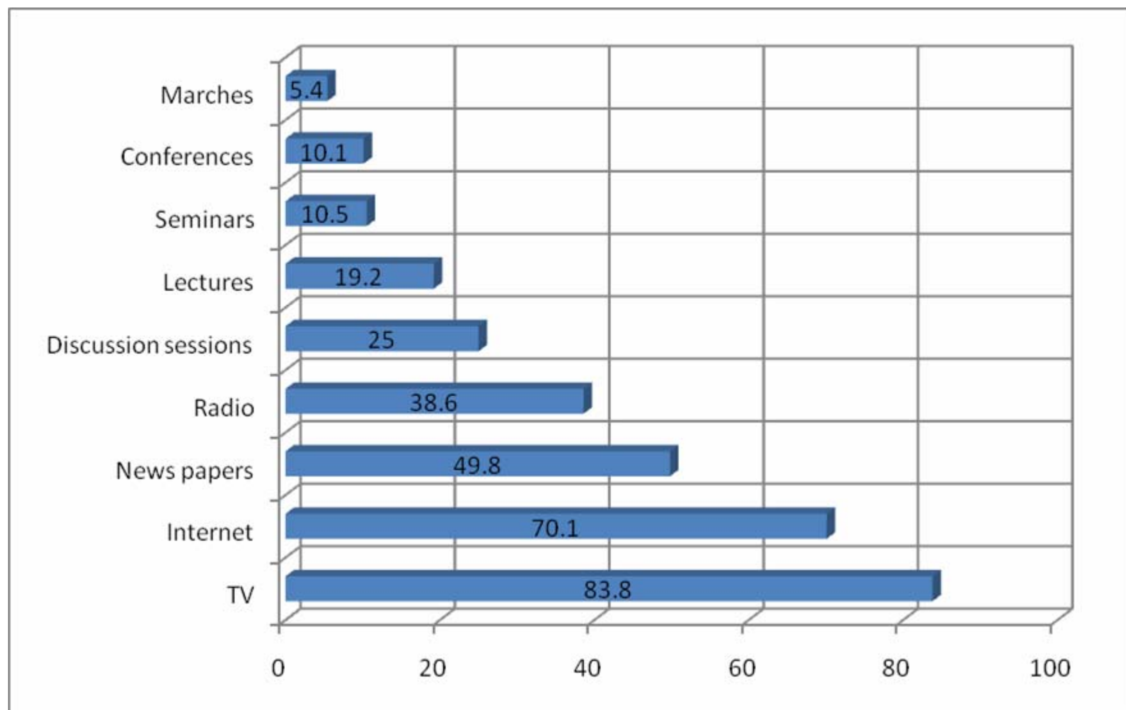


Figure 3: Sources of Information

The X-axis shows the frequency of the source of information for the respondents. The Y-axis shows the source of information that provided the respondents information regarding climate change.

In terms of how the studied population acquire their knowledge, understanding, attitudes and perceptions about climate change, when asking them a to check two sources from the above mentioned sources which provided them of information about climate change during the past years. It was found that TV (83.8), Internet (70.1), newspapers (49.8) and radio were the main sources of information, respectively. Which give us a clear idea on which source of information should be utilized on the future. Americans as referenced at (Leiserowitz et al, 2010) say they have learned the most

about global warming from television (88%), newspapers (71%), family and friends (69%), books or magazines (68%), and the internet (65%).

When asking the respondents to mention two sources of information from the above lists that they think are the main source of information they will use in the future, 724 answered TV (72.5%) and 405 (56%) answered the Internet.

When asking the studied sample about their level of information on climate change, just 17.7% of the studied sample answered that they have enough information regarding climate change issues, 77.3% answered that they do not have enough information, 3% answered that they do not have any information and 1.9% answered "I do not know or do not remember". While asking the studied sample whether they are interested to have more information about this issue or not 73.6% of the respondents answered that they are interested in having more information about climate change, with 26.4% not interested. This indicates that although people have a good basic knowledge some feel that they could learn more about the issue. In the US, (Leiserowitz et al, 2010) a large majority say that they need a lot more (25%), some more (26%), or a little more information (25%) about global warming before making up their mind about the issue.

And when asked what information they wanted on climate change, there were many answers conveyed and which are summarized in the graph below:

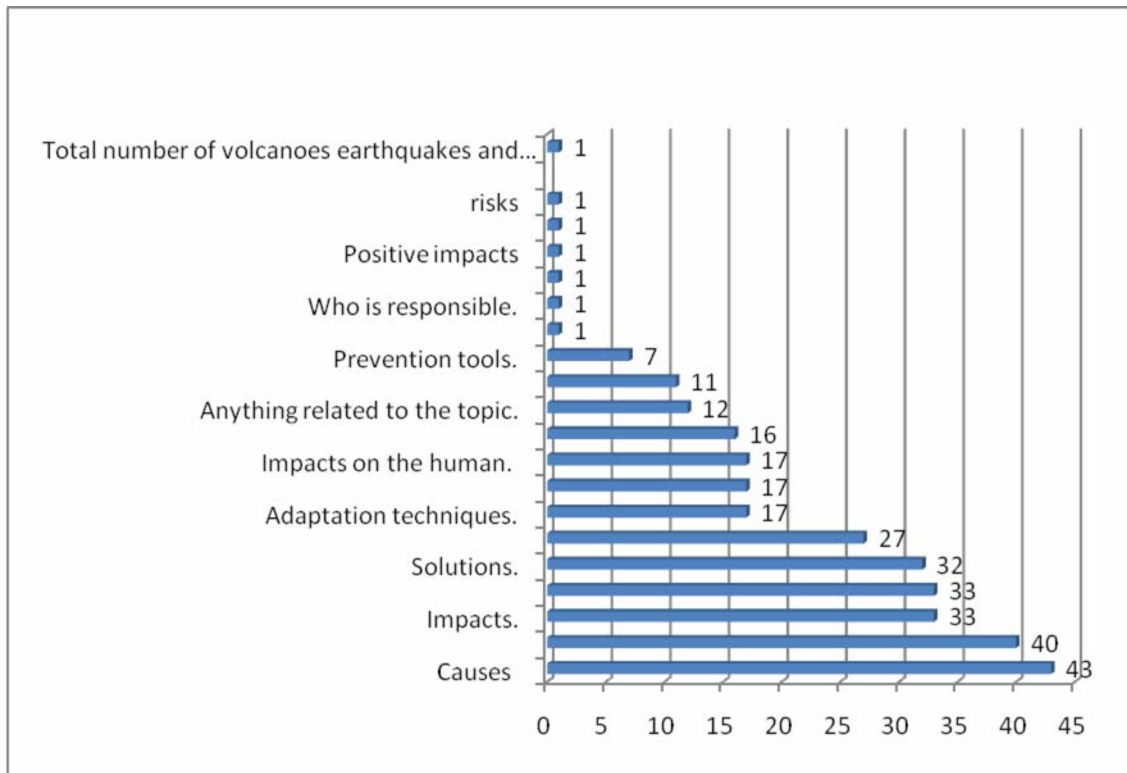


Figure 4: Information Demanded on Climate Change

The X-axis shows the frequency of information requested by the respondents to know about this issue. The Y-axis shows the requested information to be highlighted to the respondents about climate change.

When asking the respondents about the names of the governmental and non-governmental organizations that provided them with knowledge about climate change the answers were as follows:

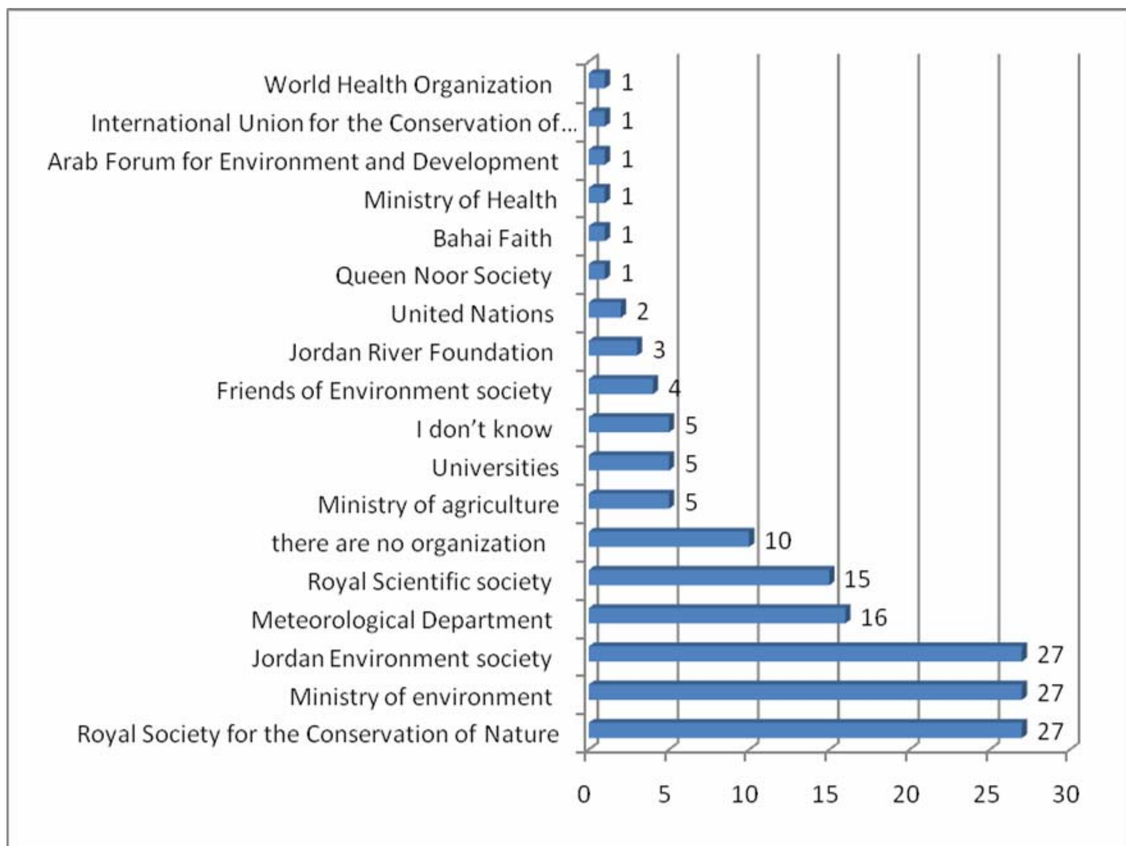


Figure 5: NGOs

The X-axis shows the frequency of NGOs (Non Governmental Organizations) mentioned by the respondents that provided them information about climate change. The Y-axis shows the name of this NGO.

In terms of institutions and organizations for climate change, only 152 respondents referenced them as sources of information. The institutions named were the Royal Society for the Conservation of Nature, the Ministry of Environment, and Jordan Environment society. Interestingly, 6.6% answered that there are no organization working in this field in Jordan and 3.3% answered they don't know any organization and this may suggest room for improvement in this sector. Americans' most trusted sources of information about global warming as referenced at (Leiserowitz et al, 2010) are the National Oceanic and Atmospheric Administration (NOAA) (78%), the National

Science Foundation (74%), scientists (72%), science programs on television (72%), natural history museums (73%), and science museums (72%).

The last question in this section was about the timing during the day to broadcast programs on TV and radio about climate change; 63.9% of the respondents selected the afternoon period and 23.8% selected the morning period.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to provide a resource to identify the concept of climate change, determine the attitudes and perception of people in Jordan towards climate change and see how they are impacted by different demographic, social and economic properties.

The study aimed to answer the following questions:

1. What is the degree of the respondents' knowledge and understanding of the climate change concept, causes and effects?
2. To what extent do the respondents express their willingness to adapt to climate change by determining their perceptions and attitudes?
3. Are there any significant differences in the degree of awareness of the respondent sample attributable to their gender, age, career or education?
4. Are there any significant differences in the degree of the respondent attitude, perceptions and willingness to adapt to climate change, attributable to their gender, age, career or education?
5. What are the main sources of getting information about climate change for the respondent?

The degree of knowledge and understanding of the concept, causes and impacts in Jordan compares well to global levels, as the results reflected interesting information about the good knowledge people living in Amman have acquired about climate change.

The perceptions and attitudes reflected a willingness to adapt and share responsibility. Due to the high response, it appears the studied population would react favourably to mitigation policies and ready to tackle climate change issue.

Age, education, gender and working or not factored significantly in the respondents knowledge and understanding of climate change. It demonstrated that the age group 31-40, working people with post-graduate degrees knew the most about climate change. These two statistics are parallel to each other and therefore understandable. However, the gap between this age/education group and the lower ages/education was startling. This shows that secondary education is not sufficiently addressing climate change and it's a subject that must be explored later in life. Also that working people while for perceptions and attitude just education factored most significantly in the respondents perceptions and attitudes. Which reflect that the only significant way to change perceptions and attitudes towards climate change is by education. This results emphasized by (Kellstedt et al., 2008) as his study revealed that The more people know about global warming, the thinking seems to go, the more they will feel personally responsible for it, and also be concerned about it

Studied population rely on TV, Internet, newspaper and radio for their information. Governmental and non-governmental institutions need to adopt climate change issues, prioritize it within their agenda and engage the public in addressing this issue since they have the positive attitudes and perception and ready to share responsibility.

In conclusion, the studied population are well educated in climate change issues but there remains room for improvement. It appears that the studied population are willing to learn and adapt programs that target this need should be initiated.

Recommendations:

- Develop a National strategic plan for mitigation and adaptation to climate change in Jordan.
- Conduct a conference on the regional level to discuss climate change as a regional issue.
- Engage all levels of the public in addressing climate change since this is a national responsibility.
- Focus on utilizing the TV, internet, Radio and newspapers in giving awareness for public about climate change concept, causes, impacts.
- Focus on highlighting day to day lives which can affect the climate, because its not just policies and industries that need to be more climate friendly , each individual has an impact on his or her environment. Choices that we make in our day-to-day lives can affect the climate. (See annex no. Five).
- Focus on broadcasting programs about climate change the afternoon and the morning.
- Utilize the social media for disseminating the media messages for this awareness campaign.
- Initiate programs that specifically target younger people (under 30), the unemployed, and women. This includes government and organizational led initiatives that highlight the causes, impacts, and mitigation techniques more effectively.

- Include climate change in secondary education curricula and universities at bachelor degrees.
- Launch a campaign that addresses common practices and misconceptions influencing climate change on a daily basis.
- Conduct more research on investigating how the gender perspective is addressed as an issue in research and policy making concerning climate change and global health. Since women are playing major role in combating this issue so will advocate for policies emphasizing or utilizing women role in this regards.

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ANNEXES

1. Annex One: Formal letter headed from the Jordanian University to facilitate the researcher's work
2. Annex Two: Study Tool " the Questionnaire"
3. Annex Three: Briefing about the statistics used in analyzing the data, and formulas.
4. Annex Four: Responses of the open question, when asking respondents to "list three programs to adapt to climate change from your point of view"
5. Annex Five: List of day to day practices that help in limiting the impacts of climate change that should use to raise public awareness.

Annex 1: Formal letter headed from the Jordanian University to facilitate the researcher's work.

الجامعة الأردنية
THE UNIVERSITY OF JORDAN

Department of Geology
Environmental and Applied Geology Program

قسم الجيولوجيا
برنامج الجيولوجيا البيئية والتطبيقية

لمن يهمه الأمر،

فيرجى التكرم بتسهيل مهمة الطالبة "ربى محمد حسن داود قمي " الرقم الجامعي " ٨٠٧٠٢٢٤" في تعبئة الاستبيان وجمع البيانات والنشرات العلمية المتعلقة بموضوع رسالتها الماجستير والمتوفرة لدى مؤسستكم الموقرة .

وتفضلوا بقبول فائق الاحترام

رئيس قسم الجيولوجيا

الدكتور غازي السفاريني

هاتف ٥٣٥٥٠٠٠ (٦ – ٩٦٢) فاكس ٥٣٤٨٩٣٢ (٦ – ٩٦٢) عمان ١١٩٤٢ الأردن
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Annex 2: Study Tool "the Questionnaire"

Climate Change Questionnaire:
Climate Change in Jordan
Knowledge, Perceptions and Attitude

Date:

This questionnaire is part of my Master's Degree at the Jordanian University researching on Knowledge, Perceptions and Attitude of Climate Change in Amman. We are interested in how you think about these issues. Don't worry about whether your ideas are right are wrong. We are interested in both favourable and adverse views of yours regarding this issue. Thank you very much for your interest and time.

Personal Information:

1. Name (not necessary):
2. Gender: 1. Male 2.female
3. Age: (…………………………) year
4. Education: 1. Elementary 2. Secondary 3. Bachelor's 4. Post grad Graduate
5. Work: 1. Working 2. Not working
6. In what field of work are you working: 1. Social 2.Economic 3.professional 4. Environmental 5.Educational 6. Cultural 7. Health 8. Others: (determine: ………………….).

Statements	Strongly Agree	Agree	neutral	Disagree	Strongly disagree
1. The World Climate is changing					
2. Climate Change is the result of human behaviour					
3. There are positive impacts for Climate Change					
4. The effects of Climate Change will be the same everywhere					
5. Fossil fuel burning (petrol, gas, coal), increases the Climate Change problem					
6. Climate Change includes increasing or decreasing temperatures					
7. Climate Change includes changes in precipitation percentages					
8. Climate Change includes changing the direction and magnitude of the wind					
9. Climate Change includes seasonal timing variation					
10. Climate Change may lead to the extinction of some animal species					
11. Climate Change affects human beings health negatively					
12. Climate Change positively affects animal's health					
13. Climate Change increases air pollution					
14. Climate Change leads to an increase in contagious diseases					
15. Climate Change increases sea levels					
16. Climate Change causes more violence in communities					

17. Climate Change is a problem which threatens human life					
18. Climate Change increases epidemiological diseases in communities.					
19. Climate Change increases hurricanes					
20. Climate Change demands more financial commitments from countries					
21. CO2 is considered as the main contributor to the Climate Change phenomenon					
22. Climate Change leads to of biodiversity loss					
23. Cutting down trees increases Climate Change problems					
24. Change in land use from agricultural to urban increases the problem of Climate Change					
25. Climate Change threatens economic investments					
26. Climate Change is a major issue in my life					
27. I can help in my personal capacity to limit the effects of Climate Change					
28. I think that there is a global understanding of the risks associated with Climate Change					
29. I think that the Climate Change problem is the largest problem facing humanity since its beginning					
30. Government is the only responsible body for Climate Change					

31. I think that the government should be as concerned about Climate Change issues as it is with the economic crisis					
32. I personally care as much about Climate Change as I care about the economic crisis					
33. I think that there is still a chance that Climate Change won't happen.					
34. Rationalizing my use of the non – renewable energy (petrol, coal and gas) will limit the adverse impacts of Climate Change					
35. Using the renewable energy (sun, wind and waves) will limit the adverse impact of Climate Change					
36. Adaptation to Climate Change is required					
37. I have the willingness to pay for the cost of Climate Change adaptation					
38. I will work on changing my behaviour to contribute to limiting the adverse impact of Climate Change					
39. Adaptation to Climate Change includes enhancing the drainage systems					
40. Adaptation to Climate Change includes building dams					

41. Community's adaptation to Climate Change decreases the adverse impacts on it					
42. Adaptation to Climate Change includes buildings design to be adequate to cope with it					
43. We are all partners in the responsibility to alleviate the negative effects of Climate Change					
44. Turning on lights does not increase the problem of Climate Change					
45. I agree to pay a certain amount of money within the electricity bill for example, in order to mitigate the negative effects of Climate Change					
46. Increased energy consumption leads to increased adverse impacts of Climate Change					
47. In order to minimize the adverse impact of Climate Change, a new clean energy must be sought such as solar and wind					
48. In order to minimize the adverse impact of Climate Change we should work on increasing the green areas					

49. from your point of view. List three programs to adopt to climate change?	1.____________________ 2.____________________ 3. ____________________

1. In general what do you think are the most important resources for information for the Jordanian Community	Resources	Put √ in front of the resource which has provided you with information about climate change during the previous period	Put √ in front of the best two resources you believe are best in delivering information about climate change
	1. TV		
	2. Radio		
	3. Newspapers		
	4. Internet		
	5. Seminars		
	6. Conferences		
	7. Lectures		
	8. Marches		
	9. Discussions sessions		

2. organizations that provide you with information about climate change	______________ ______________ ______________

3. Do you think that your knowledge about climate change is:	1. Enough	2. Not enough	3.I don't have any information	4. I don't know

4. Are you interested to know more about climate change	1. Yes	2. No	If you are interested? What kind of information is you interested to know?

5. In your opinion, what is the suitable time for broadcasting programs about Climate Change?	1. Morning 2. Lunchtime 3. Afternoon 4. Night

استبيان

التغيرالمناخي في الاردن

المعرفة والاتجاهات

تاريخ اليوم: -----------------------

هــذا الاســتبيان هــو جــزء مــن رســالتي الماجــستير فــي الجامعــة الاردنيــة – بحــث حــول المعرفــة والاتجاهــات فــي عمــان عــن التغيرالمنــاخي، نحــن مهتمــون بمعرفــة كيــف تفكــر ومــا هــي معلوماتــك حــول موضــوع التغيرالمنــاخي، لا تقلــق فيمــا اذا كانــت اجاباتــك صــحيحة أم خاطئــة فقــط نريــد ان نعرف كل ما لديك حول هذا الموضوع .

المعلومات الشخصية :

١. الاسم (ليس ضروري) :
٢. العمر: (.................) سنة
٣. الجنس : ١. ذكر ٢.انثى
٤. المستوى التعليمي :١. أمي ٢.اساسي ٣. ثانوي ٤. بكالوريوس ٥.دراسات عليا
٥. العمل: ١. يعمل ٢. لا يعمل
٦. إذا كنــت تعمــل فــي اي مجــال / قطــاع تعمــل: ١. اجتمــاعي ٢.اقتــصادي ٣. مهنــي ٤. بيئــي ٥. تعليمي ٦. ثقافي ٧. الصحي ٨. أخرى (حدد ....)

- ضع اشارة √ امام العبارة التي تتوافق مع رأيك :

	أوافق بشدة	أوافق	محايد	لا اوافق	لاأوافق بشدة
١. المناخ في تغيير مستمر					
٢. لأنشطة الإنسان اثر في تغير المناخ					
٣. هنالك آثار ايجابية للتغيير المناخي					
٤. الآثار الناجمة عن التغير المناخي متساوية في جميع بلدان العالم					
٥. عملية احتراق الوقود الاحفوري (النفط، الغاز، الفحم) تعمل على زيادة مشكلة التغير المناخي.					
٦. تغيير المناخ يعني ارتفاع أو انخفاض في درجات الحرارة					
٧. تغيير المناخ يعني التغير في معدل الهطول (مطر، برد، ثلج).					
٨. تغير المناخ يعني التغير في سرعة واتجاه الرياح					
٩. تغير المناخ يعني التغير في أوقات فصول السنة					
١٠.تغير المناخ يؤدي إلى انقراض بعض أنواع الحيوانات.					
١١.تغير المناخ يؤثر سلبا على صحة الإنسان					
١٢.تغير المناخ يؤثر إيجابا على صحة الحيوان					
١٣.تغير المناخ يعمل على زيادة تلوث الهواء					
١٤.تغير المناخ يؤدي إلى زيادة الأمراض المعدية					
١٥.تغير المناخ يعمل على ارتفاع منسوب البحار					
١٦.تغير المناخ يؤدي إلى زيادة العنف المجتمعي					
١٧.تغير المناخ هو مشكلة تهدد حياة الإنسان					
١٨.تغير المناخ يزيد من الآفات والأمراض للمجتمعات					
١٩.التغير المناخي يؤدي إلى زيادة الأعاصير					
٢٠.التغير المناخي يزيد من الأعباء المالية على الدول					
٢١.يعتبر غاز ثاني أكسيد الكربون من أهم الغازات التي تساهم في ظاهرة التغيير المناخي					
٢٢.التغير المناخي يؤدي إلى فقدان التنوع الحيوي					
٢٣.قطع الأشجار يزيد من مشكلة التغير المناخي					
٢٤.التغير في استخدام الأراضي من زراعية إلى عمرانية يزيد من مشكلة التغير المناخي					
٢٥.التغير المناخي يؤدي إلى تهديد الاستثمارات الاقتصادية					
٢٦.يعتبر التغير المناخي قضية مهمة في حياتي					
٢٧.أنا شخصيا بإمكاني أن أساعد في تقليل الآثار السلبية للتغيير المناخي					
٢٨.اعتقد أن هنالك إدراك عالمي اليوم عن مدى خطورة التغير المناخي					
٢٩.أعتقد أن مشكلة التغير المناخي هي أكبر مشكة واجهتها البشرية منذ وجودها					
٣٠.الحكومات فقط بإمكانها أن تساعد في التقليل من					

					الآثار السلبية للتغيير المناخي
					٣١.أعتقد أنه على الحكومات الاهتمام بقضية التغير المناخي تماما كما تهتم بموضوع الأزمة الاقتصادية العالمية
					٣٢.أهتم أنا شخصيا بقضية التغير المناخي كما أهتم بموضوع الأزمة الاقتصادية العالمية
					٣٣.اعتقد ان التغير المناخي شيء لم ولن يحدث
					٣٤.ترشيد استخدامي للطاقة غير المتجددة (النفط، الفحم،الغاز) سيعمل على الحد من التغير المناخي
					٣٥.استخدامي لموارد الطاقة المتجددة (كالشمس والهواء والأمواج....) سيعمل على الحد من أثار التغير المناخي
					٣٦.يجب العمل على التكيف مع مشكلة التغير المناخي
					٣٧.أنا على استعداد أن أشارك بدفع تكاليف التكيف مع التغيير المناخي.
					٣٨.سأعمل على تغيير سلوكياتي اليومية والتي تساهم في الحد من التغير المناخي.
					٣٩.للتكيف مع مشكلة التغير المناخي يجب العمل على زيادة الدفاعات ضد الفيضانات.
					٤٠.للتكيف مع مشكلة التغير المناخي يجب العمل على بناء السدود
					٤١.تكييف المجتمعات مع التغيير المناخي يخفف من الاثار السلبية عليها.
					٤٢.يشمل التكيف، مع التغير المناخي عملية البناء وتصاميمه بحيث تكون مكيفة بشكل كافي لمواجهة تقلبات الطقس
					٤٣.كلنا شركاء في المسؤولية للتخفيف من الآثار السلبية للتغير المناخي .
					٤٤.إنارة الأضواء لا يزيد من مشكلة التغيير المناخي
					٤٥.أوافق على دفعي مبلغ من المال ضمن فاتورة الكهرباء مثلا للتخفيف من الآثار السلبية للتغير المناخي
					٤٦..زيادة استهلاكي للطاقة يؤدي إلى زيادة الآثار السلبية للتغير المناخي
					٤٧.للتقليل من الآثار السلبية للتغير المناخي يجب البحث عن مصادر بديلة نظيفة للطاقة مثل طاقة الشمس والرياح
					٤٨.للتقليل من الآثار السلبية لمشكلة التغير المناخي يجب العمل على زيادة المساحات الخضراء
					٤٩.من وجهة نظرك، عدد ثلاثة طرق أو برامج للتكييف مع التغير المناخي.

١.ما هي الوسائل التي تزودك بالمعلومات حول التغيرالمناخي ؟	**الأنشطة**	**الاجابة**	
		ضع إشارة √ الوسيلة التي زودتك بالمعلومات خلال الفترة الماضية	ضع اشارة √ أمام أفضل وسيلتين يفض استعمالهما برأيك لإيصال معلومات عن التغير المناخي للناس
	١. التلفاز		
	٢. الاذاعة		
	٣. الصحف		
	٤. الانترنت		
	٥. الندوات		
	٦. المؤتمرات		
	٧. المحاضرات		
	٨. المسيرات		
	٩. جلسات نقاشية		

١٠.ما هي أهم الجمعيات أو الاتحادات غير الحكومية التي تزودك بمعلومات عن التغيرالمناخي ؟	
	________________ ________________ ________________ لأعرف / لا أتذكر

١١.هل تعتقد ان معلوماتك عن التغيرالمناخي ....؟	معلومات كافية	غير كافية	لا يوجد لدي اي معلومات	لاعرف/ لا اتذكر

١٢.هل لديك اهتمام في معرفة معلومات حول التغير المناخي ؟	نعم	لا	أذا كانت الاجابة نعم، ماذا تريد ان تعرف؟

١٣.ما هي برأيك أفضل الأوقات لبث برامج في موضوع التغيرالمناخي ؟	١. الفترة الصباحية ٢. فترة ما بعد الظهر ٣. الفترة المسائية ٤. فترة منتصف الليلا

Annex 3: Briefing about the statistics used in analyzing the data and the formulas.

Construct validity

(From Wikipedia, the free encyclopaedia, 2011)
In science (e.g. social sciences and psychometrics), construct validity refers to whether a scale measures or correlates with the theorized psychological scientific construct (e.g., "fluid intelligence") that it purports to measure. In other words, it is the extent to which what was to be measured was actually measured. It is related to the theoretical ideas behind the trait under consideration, i.e. the concepts that organize how aspects of personality, intelligence, etc. are viewed. The scale seeks to operationalise the concept, typically measuring several observable phenomena that supposedly reflect the underlying psychological concept. Construct validity is a means of assessing how well this has been accomplished. In lay terms, construct validity answers the question: "Are we actually measuring (are these means a valid form for measuring) what (the construct) we think we are measuring?"

A construct is not restricted to one set of observable indicators or attributes. It is common to a number of sets of indicators. Thus, "construct validity" can be evaluated by statistical methods that show whether or not a common factor can be shown to exist underlying several measurements using different observable indicators. This view of a construct rejects the operationist past that a construct is neither more nor less than the operations used to measure it.

Evaluation of construct validity requires that the correlations of the measure be examined in regards to variables that are known to be related to the construct (purportedly measured by the instrument being evaluated or for which there are

theoretical grounds for expecting it to be related). This is consistent with the multitrait-multimethod matrix of examining construct validity described in Campbell and Fiske's landmark paper (1959). Correlations that fit the expected pattern contribute evidence of construct validity. Construct validity is a judgment based on the accumulation of correlations from numerous studies using the instrument being evaluated.

Reliability coefficient (Cronbach's α alpha) is a coefficient of reliability. It is commonly used as a measure of the internal consistency or reliability of a psychometric test score for a sample of examinees. It was first named alpha by Lee Cronbach in 1951, as he had intended to continue with further coefficients. The measure can be viewed as an extension of the Kuder-Richardson Formula 20 (KR-20), which is an equivalent measure for dichotomous items. Alpha is not robust against missing data. Several other Greek letters have been used by later researchers to designate other measures used in a similar context. Somewhat related is the average variance extracted (AVE).

Cronbach's alpha statistic is widely used in the social sciences, business, nursing, and other disciplines. The term item is used throughout this article, but items could be anything — questions, raters, indicators — of which one might ask to what extent they "measure the same thing". Items that are manipulated are commonly referred to as variables.

Definition

Cronbach's α is defined as

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{K}\sigma^2_{Y_i}}{\sigma^2_X}\right)$$

where K is the number of components (K-items or testlets), σ_X^2 the variance of the observed total test scores, and $\sigma_{Y_i}^2$ the variance of component i for the current sample of persons.

Theoretically, alpha varies from zero to 1, since it is the ratio of two variances. Empirically, however, alpha can take on any value less than or equal to 1, including negative values, although only positive values make sense. Higher values of alpha are more desirable. Some professionals, as a rule of thumb, require a reliability of 0.70 or higher (obtained on a substantial sample) before they will use an instrument. Obviously, this rule should be applied with caution when α has been computed from items that systematically violate its assumptions. Furthermore, the appropriate degree of reliability depends upon the use of the instrument. For example, an instrument designed to be used as part of a battery of tests may be intentionally designed to be as short as possible, and therefore somewhat less reliable. Other situations may require extremely precise measures with very high reliabilities.

Analysis of variances (ANOVA): In statistics, analysis of variance (ANOVA) is a collection of statistical models, and their associated procedures, in which the observed variance in a particular variable is partitioned into components attributable to different sources of variation. In its simplest form ANOVA provides a statistical test of whether or not the means of several groups are all equal, and therefore generalizes t-test to more than two groups. ANOVAs are helpful because they possess an advantage over a two-sample t-test. Doing multiple two-sample t-tests would result in an increased chance of committing a type I error. For this reason, ANOVAs are useful in comparing two, three or more means.

Student's t-test

A t-test: is any statistical hypothesis test in which the test statistic follows a Student's t distribution, if the null hypothesis is supported. It is most commonly applied when the test statistic would follow a normal distribution if the value of a scaling term in the test statistic were known. When the scaling term is unknown and is replaced by an estimate based on the data, the test statistic (under certain conditions) follows a Student's t distribution.

Assumptions

Most t-test statistics have the form T = Z/s, where Z and s are functions of the data. Typically, Z is designed to be sensitive to the alternative hypothesis (i.e. its magnitude tends to be larger when the alternative hypothesis is true), whereas s is a scaling parameter that allows the distribution of T to be determined.

As an example, in the one-sample t-test Z is $\sqrt{n}\bar{X}/\sigma$, where $\bar{X}$ is the sample mean of the data, n is the sample size, and σ is the population standard deviation of the data; s in the one-sample t-test is $\hat{\sigma}/\sigma$, where $\hat{\sigma}$ is the sample standard deviation.

The assumptions underlying a t-test are that

Z follows a standard normal distribution under the null hypothesis

ps2 follows a χ2 distribution with p degrees of freedom under the null hypothesis, where p is a positive constant

Z and s are independent.

Tukey's range test:

Tukey's test, also known as the Tukey range test, Tukey method, Tukey's honest significance test, Tukey's HSD (Honestly Significant Difference) test, or the Tukey–Kramer method, is a single-step multiple comparison procedure and statistical

test generally used in conjunction with an ANOVA to find which means are significantly different from one another. Named after John Tukey, it compares all possible pairs of means, and is based on a studentized range distribution q (this distribution is similar to the distribution of t from the t-test).

The test compares the means of every treatment to the means of every other treatment; that is, it applies simultaneously to the set of all pair wise comparisons

$$\mu_i - \mu_j$$

and identifies where the difference between two means is greater than the standard error would be expected to allow. The confidence coefficient for the set, when all sample sizes are equal, is exactly 1 − α. For unequal sample sizes, the confidence coefficient is greater than 1 − α. In other words, the Tukey method is conservative when there are unequal sample sizes.

Assumptions of Tukey's test

The observations being tested are independent

There is equal variation across observations (homoscedasticity).

The test statistic

Tukey's test is based on a formula very similar to that of the t-test. In fact, Tukey's test is essentially a t-test, except that it corrects for experiment-wise error rate (when there are multiple comparisons being made, the probability of making a type I error increases — Tukey's test corrects for that, and is thus more suitable for multiple comparisons than doing a number of t-tests would be).

The formula for Tukey's test is:

$$q_s = \frac{Y_A - Y_B}{SE},$$

where YA is the larger of the two means being compared, YB is the smaller of the two means being compared, and SE is the standard error of the data in question.

This qs value can then be compared to a q value from the studentized range distribution. If the qs value is larger than the qcritical value obtained from the distribution, the two means are said to be significantly different.

Since the null hypothesis for Tukey's test states that all means being compared are from the same population (ie. $\mu1 = \mu2 = \mu3 = ... = \mu n$), the means should be normally distributed (according to the central limit theorem). This gives rise to the normality assumption of Tukey's test.

Annex 4: Responses of the open question, when asking respondents to "list three programs to adapt to climate change from your point of view "after classifying them into groups by the researcher.

Category	Suggested actions by respondents	Frequency
Suggested Programs related to Technology	Using hybrid cars	7
	Using new machines based on the renewable energy	5
	Use energy-saving bulbs	1
	Using cars run by solar energy	1
	Total frequency	14
	Percentage	1.8%
Suggested Programs related to Legislation	Legislation amendments to impose stricter sanctions for everyone who increases the pollutants of climate change.	14
	Buildings designed to be more environmental friendly and adapted to harsh climatic conditions	32
	Punishments or penalties for every violation caused by any factory or company.	2
	Total frequency	48
	percentage	6.3%
Suggested Programs related to Personal initiative	Rationalize using non renewable energy	65
	Reduce the use of pollutants that cause climate change	22
	Use public buses	12
	Water conservation	1
	Reduce the burning of waste	6
	Do not throw waste	5
	Total frequency	111
	Percentage	13.2%
Suggested Programs related to Policies and plans	Using renewable energy	108
	Increasing of green areas	92
	Awareness programs	70
	Intense studies and research on the subject	33
	Not to cut down trees	17
	Improve the infrastructure of rain water drainage	17
	Reduction of urban sprawl	16
	Waste recycling	15
	Water conservation	14
	Using filters at factories in order to purify the air emissions from industries	10
	Develop adaptation plans to climate change on the national level	12
	Limit the distribution of industrial factories, especially on agricultural lands	8
	Waste separation	7
	Limit usage of chemicals	7
	Stop using cars for one day on the national level	4
	Combat desertification	6
	Reducing diesel cars	1

Category	Suggested actions by respondents	Frequency
	Using environmentally friendly fuel	1
	Expansion of horizontal not vertical buildings	1
	Reducing overgrazing	1
	Focus on crops with little need for water and enhance agricultural patterns to be more environmental friendly	1
	Using recyclable materials	1
	Total frequency	442
	Percentage	57.6%
Suggested Programs related to Government	Allocate a budget for climate change adaptation purposes	12
	Develop plans in cooperation with other countries to adapt to climate change	5
	Develop and implement plans on the national level for climate change adaptation	5
	Building dams	53
	Secure an efficient transportation system for dispensing with the use of private cars	5
	Construction of wells	2
	Support services that run on renewable energy	1
	Insert an introduction about climate change as a requirement in school and university curricula	1
	Establish an environmental fund aimed at supporting environmental projects especially for developing countries	1
	Engaging both the private and public sectors	1
	Launch awards targeted at youth for the best drawing about climate change. This will lead eventually to stimulating them to read and know more about the issue.	1
	Total frequency	87
	Percentage	11.3%
Irrelevant suggested programs to climate change mitigation programs	Acquisitions of conditions	23
	Elimination of the United States + Israel	1
	Elimination of the major industrialized countries	1
	Use Fans	5
	Haircuts	1
	Spraying water	1
	Use heater	6
	Reducing the working hours	1
	Using clothes suitable to the weather conditions	3
	Raise the wages of workers	1
	Reduce the use of air conditioners	1
	Move homes away from the coast	1
	Not to build on the coastal areas	1
	Travelling between different regions based on the climatic conditions	1
	Human endurance	1
	Take care of marines’ ecosystems	1

Category	Suggested actions by respondents	Frequency
	Make basins around trees	1
	Follow-up climate News	1
	Thank God for everything	1
	Portable air conditioner with each person	1
	To resort to swimming pools	1
	Take care of animals	5
	Total frequency	59
	Percentage	7.7%
Miscellaneous	Stop the factories' activities in developed countries	1
	Water desalination	1
	Reduce the nuclear contamination percentages	1
	Reducing wars percentages	1
	Construction of natural reserves	1
	Mechanisms to deal with waste	1
	Reduce the use of paper	1
	The use of greenhouses for cultivation	1
	Plant a belt of trees around each school	1
	Reducing overgrazing	1
	The cooperation of all religions to protect the earth's environment	1
	Preventive procedures for protecting human health	1
	Improved means of monitoring the ground, which monitors the conditions of the oceans and atmosphere	1
	Punish the eight major countries on top that refuse to sign the Kyoto Protocol	1
	Establish free lines affiliated from the weather and meteorology Department dedicated to receive calls from the public regarding any issue of climate change	1
	Rationalizing the use of the materials that lead to maximizing the problem of the ozone layer	1
	Incentives or awards targeted at factories and companies which contribute to limiting the climate change pollutants	1
	Total frequency	17
	Percentage	2.2%

Annex 5: List of day to day practices that help in limiting the impacts of climate change that should use to raise public awareness.

From http://www.awelamantawe.org.uk

Things you can do today at no cost:

1. Turn off lights when you leave a room
2. Only boil the amount of water you need in your kettle
3. Turn off televisions, videos, stereos and computers when they are not in use - they can use between 10 and 60% of the power they use when on
4. Close curtains at dusk to keep in heat
5. Let your clothes dry naturally rather than using a tumble drier
6. Turning down the thermostat for your heating by 1 degree could cut your heating bill by 10%
7. Use economy programmes on dishwashers or washing machines

Things you can do in the future or with an initial cost:

1. Use energy saving light bulbs - they use a quarter of the electricity and last much longer
2. Insulate your hot water tank and pipes
3. Fit seals to externals doors, skirting boards and floor boards to reduce heat loss - 15% of heat is lost through draughts and 15% through the floor
4. Make your windows draught proof or fit double glazing - this cuts heat loss in half - up to 10% of heat is lost through uninsulated windows
5. Fit loft insulation - which should be at least 200mm thick to be most effective - 25% of heat is lost through an uninsulated roof
6. Fit wall insulation - up to 33% of heat is lost through uninsulated walls

Annex 6: ANOVA and Post-Hoc tests for demographic variables

Table 15: ANOVA Age

ANOVA

		Sum of Squares	df (degrees of freedom)	Mean Square	F-Value	Sig.
Knowledge and understanding	Between Groups	2.676	5	0.535	3.802	0.002
	Within Groups	100.913	717	0.141		
	Total	103.589	722			
Attitude, perceptions	Between Groups	1.736	5	0.347	2.000	0.077
	Within Groups	124.476	717	0.174		
	Total	126.212	722			

Table 16: Tukey Test Age

Dependent Variable	(I) age level	(J) age level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Upper Bound	Lower Bound
Knowledge and understanding	21 or less	21-30	-0.062	0.037	0.558	-0.17	0.04
		31-40	-.174(*)	0.046	0.002	-0.31	-0.04
		41-50	-0.153	0.057	0.084	-0.32	0.01
		51-60	-0.143	0.079	0.459	-0.37	0.08
		61- more	-0.173	0.102	0.532	-0.46	0.12
	21-30	20 or less	0.062	0.037	0.558	-0.04	0.17
		31-40	-.112(*)	0.039	0.049	-0.22	0.00
		41-50	-0.091	0.052	0.497	-0.24	0.06
		51-60	-0.081	0.075	0.890	-0.29	0.13
		61-more	-0.111	0.099	0.871	-0.39	0.17
	31-40	20 or less	.174(*)	0.046	0.002	0.04	0.31
		21-30	.112(*)	0.039	0.049	0.00	0.22
		41-50	0.021	0.059	0.999	-0.15	0.19
		51-60	0.031	0.080	0.999	-0.20	0.26
		61-more	0.001	0.103	1.000	-0.29	0.29
	41-50	20 or less	0.153	0.057	0.084	-0.01	0.32
		21-30	0.091	0.052	0.497	-0.06	0.24
		31-40	-0.021	0.059	0.999	-0.19	0.15
		51-60	0.010	0.087	1.000	-0.24	0.26
		61- more	-0.020	0.108	1.000	-0.33	0.29
	51-60	20 or less	0.143	0.079	0.459	-0.08	0.37
		21-30	0.081	0.075	0.890	-0.13	0.29
		31-40	-0.031	0.080	0.999	-0.26	0.20
		41-50	-0.010	0.087	1.000	-0.26	0.24
		61-more	-0.030	0.121	1.000	-0.38	0.31
	61- more	20 or less	0.173	0.102	0.532	-0.12	0.46
		21-30	0.111	0.099	0.871	-0.17	0.39
		31-40	-0.001	0.103	1.000	-0.29	0.29
		41-50	0.020	0.108	1.000	-0.29	0.33

		50 - 60	0.030	0.121	1.000	-0.31	0.38
Attitude, perceptions	21 or less	21-30	0.075	0.041	0.461	-0.04	0.19
		31-40	0.001	0.051	1.000	-0.15	0.15
		41-50	-0.051	0.064	0.968	-0.23	0.13
		51-60	-0.006	0.088	1.000	-0.26	0.24
		61-more	-0.123	0.113	0.887	-0.45	0.20
	21-30	20 or less	-0.075	0.041	0.461	-0.19	0.04
		31- 40	-0.074	0.043	0.529	-0.20	0.05
		41-50	-0.126	0.058	0.247	-0.29	0.04
		51-60	-0.081	0.083	0.928	-0.32	0.16
		61-more	-0.198	0.110	0.466	-0.51	0.12
	31-40	20 or less	-0.001	0.051	1.000	-0.15	0.15
		21-30	0.074	0.043	0.529	-0.05	0.20
		41-50	-0.052	0.065	0.968	-0.24	0.13
		51-60	-0.007	0.088	1.000	-0.26	0.25
		61-more	-0.124	0.114	0.887	-0.45	0.20
	41-50	20 or less	0.051	0.064	0.968	-0.13	0.23
		21-30	0.126	0.058	0.247	-0.04	0.29
		31-40	0.052	0.065	0.968	-0.13	0.24
		51-60	0.045	0.096	0.997	-0.23	0.32
		61-more	-0.072	0.120	0.991	-0.41	0.27
	51-60	20 or less	0.006	0.088	1.000	-0.24	0.26
		21-30	0.081	0.083	0.928	-0.16	0.32
		31-40	0.007	0.088	1.000	-0.25	0.26
		41-50	-0.045	0.096	0.997	-0.32	0.23
		61-more	-0.117	0.134	0.953	-0.50	0.27
	61-more	21 or less	0.123	0.113	0.887	-0.20	0.45
		21-30	0.198	0.110	0.466	-0.12	0.51
		31-40	0.124	0.114	0.887	-0.20	0.45
		41-50	0.072	0.120	0.991	-0.27	0.41
		51-60	0.117	0.134	0.953	-0.27	0.50

Table 17: ANOVA, Education

		Sum of Squares	Df (degree of freedom)	Mean Square	F- value	Sig.
knowledge and Understanding	Between Groups	2.526	3	0.842	5.990	0.000
	Within Groups	101.063	719	0.141		
	Total	103.589	722			
Attitude, perceptions	Between Groups	3.043	3	1.014	5.922	0.001
	Within Groups	123.169	719	0.171		
	Total	126.212	722			

Table 18: Tukey Test, Education

Dependent Variable	(I) Education Level	(J) Education level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Upper Bound	Lower Bound
Concept	elementary	secondary	-0.166	0.077	0.132	-0.36	0.03
		bachelor	-0.114	0.071	0.369	-0.30	0.07
		Post graduate	-.266(*)	0.078	0.004	-0.47	-0.06
	secondary	elementary	0.166	0.077	0.132	-0.03	0.36
		bachelor	0.052	0.038	0.525	-0.05	0.15
		Post graduate	-0.100	0.051	0.212	-0.23	0.03
	bachelor	elementary	0.114	0.071	0.369	-0.07	0.30
		secondary	-0.052	0.038	0.525	-0.15	0.05
		Post graduate	-.152(*)	0.042	0.002	-0.26	-0.04
	post graduate	elementary	.266(*)	0.078	0.004	0.06	0.47
		secondary	0.100	0.051	0.212	-0.03	0.23
		bachelor	.152(*)	0.042	0.002	0.04	0.26
Attitude, perceptions	elementary	secondary	-0.097	0.085	0.661	-0.31	0.12
		bachelor	-0.007	0.078	1.000	-0.21	0.19
		Post graduate	-0.188	0.086	0.132	-0.41	0.03
	secondary	elementary	0.097	0.085	0.661	-0.12	0.31
		bachelor	0.090	0.042	0.148	-0.02	0.20
		Post graduate	-0.091	0.057	0.377	-0.24	0.05
	bachelor	elementary	0.007	0.078	1.000	-0.19	0.21
		secondary	-0.090	0.042	0.148	-0.20	0.02
		Post graduate	-.181(*)	0.046	0.001	-0.30	-0.06
	post graduate	elementary	0.188	0.086	0.132	-0.03	0.41
		secondary	0.091	0.057	0.377	-0.05	0.24
		bachelor	.181(*)	0.046	0.001	0.06	0.30

*. The mean difference is significant at the .05 level.

Table 19: ANOVA, Work Field

		Sum of Squares	df (degree of freedom)	Mean Square	F - value	Sig.
Knowledge and understanding	Between Groups	1.785	7	0.255	1.744	0.097
	Within Groups	64.775	443	0.146		
	Total	66.559	450			
attitude, perceptions	Between Groups	1.365	7	0.195	1.160	0.325
	Within Groups	74.491	443	0.168		
	Total	75.856	450			

المعرفة والاتجاهات لدى سكان مدينة عمان للتغيير المناخي

إعداد
ربى"محمد حسن" داود قمي

المشرف
الدكتور بشار الصمادي

ملخـــــــــص

ليس من الممكن أن يكون هناك أي حل فعال وكفؤ للحد من الأثار السلبية للتغير المناخي، ما لم يكن هناك صورة واضحة لفهم المجتمعات لهذه الظاهرة، وبناء عليه، فإن هذه الدراسة تهدف إلى إعطاء صورة واضحة لصانعي القرار، والمخططين عن وعي واتجاهات مجتمع الدراسة "عمان" حول قضية التغيير المناخي لتكون خطوة نحو التوعية بشأن تغير المناخ في الأردن مبنية علــى تصور عن الوعي العام حول أسباب ومفهوم وآثار تغير المناخ ؛ تحديد المواقــف والتــصورات حول القضية ؛ تحديد مدى القابلية والإستعداد لتبني برامج للحد من الآثار السلبية للتغير المناخي ، وتحديد تأثير الخصائص الديموغرافية والاجتماعية والاقتصادية مثل العمر، والجنس، والعمل، ودرجة التعليم في فهم القضية. عن طريق دراسة استجابات عينة الدراسة على استبانة الدراســة التي تم تطويرها من قبل الباحث من خلال استعراض الدوريات العلمية الحديثة والكتب، والذي تم اختبار صدقه وثباته. بعد ذلك ، تم اختيار عينة طبقية عنقودية من مجتمع الدراســة (امانــة عمان الكبرى) حجمها ٧٢٣ حيث تم توزيع ١٢٠٠ استبيان وتعبئة وجمع فقط ٧٢٣ استبيان .

أظهرت نتائج الاستبيان أن ٨٨ ٪ من مجموع الجمل التي تقيس المعرفــة والإدراك لموضــوع التغيير المناخي كان المتوسط الحسابي لها ما بين ٣,٤ – ٥ مما يعكس أن مجتمع الدراسة لديهم خلفية معرفية جيدة عن القضية ، وان ٧٨ ٪ من مجموع الجمل التي تقيس الإتجاهات والمواقف والاستعداد لتبني القضية كان المتوسط الحسابي ما بين ٣,٤- ٥، مما يعكس أن مجتمع الدراســة يملك مواقف واتجاهات ايجابية للقضية ولديها النية لتبني برامج للحد من الاثار السلبية للقضية ، نستخلص من النسب المذكورة أعلاه، أن مجتمع الدراسة قابل للمشاركة في مسؤولية التخفيف من الآثار السلبية للقضية ، وأيضاً بينت نتائج الدراسة أن هناك فروق ذات دلالة احصائية بين فهــم وإدراك المستجبين للقضية تعزى إلى العمر والتعليم والجنس وطبيعــة العمــل. أمــا بالنــسبة لإتجاهاتهم ومواقفهم فالنتائج بينت أن هنالك فروق ذات دلالة احصائية تعزى فقط لمتغير التعليم، اما عن مصادر معلومات سكان عمان للمعلومات بشان التغيير المناخي، تبــين أن التلفــاز هــو

المصدر الاول للمعلومات بنسبة ٨٣،٨ ٪ ، يليه الانترنت بنسبة ٧٠،١ ٪ ، ثم الصحف بنسبة ٤٩،٨ ٪ والراديو بنسبة ٣٨،٦ ٪ .

وفي الختام ، نستنتج أن مجتمع الدراسة "سكان عمان" على استعداد للتخفيف من حدة المشكلة، ومن ضمن توصيات الدراسة أن تستهدف برامج التوعية عن الموضوع على وجه التحديد الفئات العمرية الشابة (تحت ٣٠) ، والعاطلين عن العمل ، والنساء. وهذا يشمل سواء البرامج المنفذة من قبل الحكومة او مبادرات مؤسسات المجتمع المدني، مع مراعاة تسليط الضوء على التوعية بأهم أسباب وآثار القضية واليات الحد من القضية بشكل أكثر فعالية.